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Editors



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CONTENTS

Vol. 8 No. 1 (2021)

Vocational Students' Ways of Handling the Academic/Vocational Divide
Lisa Ferm

Returns to Workplace Training for Male and Female Employees and Implications for the Gender Wage gap: A Quantile Regression Analysis
Rossella Icardi

Varieties Within a Collective Skill Formation System: How VET Governance in Switzerland is Shaped by Associations
Regula Bürgi, Philipp Gonon

How Florist Apprentices Explore Bouquet Designs: Supporting Design Space Exploration for Vocational Students
Kevin Gonyop Kim, Catharine Oertel, Pierre Dillenbourg

Regional Disparities in the Training Market: Opportunities for Adolescents to Obtain a Company-Based Training Place Depending on Regional Training Market Conditions
Christian Michaelis, Robin Busse

The Dilemmas of Flexibilisation of Vocational Education and Training: A Case Study of the Piano Makers
Carmen Baumeler, Sonja Engelage, Alexandra Strebel

Vol. 8 No. 2 (2021)

Transition From Low-Threshold Vocational Education and Training to Work in Switzerland: Factors Influencing Objective and Subjective Career Success
Claudia Hofmann, Kurt Häfeli, Xenia Müller, Annette Krauss

Visualising the Intended Practical Doing: Future-Oriented Movements in Swedish Vocational School Workshop Settings
Stig-Börje Asplund, Nina Kilbrink, Hamid Asghari

Comparative Analysis of the Process of Training Education Managers in Educational Institutions
Askarbek K. Kusainov, Kamchat A. Yessenova, Roza S. Kassymova, Kuanysh S. Moldassan, Ardak M. Sembayeva

Digitalisation in Agriculture: Knowledge and Learning Requirements of German Dairy Farmers
Michael Goller, Carina Caruso, Christian Harteis

Apprentices' Resources at Work and School in Switzerland: A Person-Centred Approach
Fabienne Lüthi, Barbara E. Stalder, Achim Elfering

Vol. 8 No. 3 (2021)

Moving From Fragmented to Seamless Sense-Making in Blended Learning
Bi Xiaofang

The Role of Vocational Education and Training in the Integration of Refugees in Austria, Denmark and Germany
Christian Helms Jørgensen, Hannes Hautz, Junmin Li

Programs' Efficacy to Develop Employable Skills for People With Functional Diversity: A Meta-Analysis
Carolina Gonzálvez, Fernando Marhuenda-Fluixá

Gendered Vocational Identities – Female Students' Strategies for Identity Formation During Workplace-Based Learning in Male-Dominated Work
Lisa Ferm, Maria Gustavsson

Vol. 8 No. 4 (2021)
Special Issue: International Vocational Education and Training Research

International Vocational Education and Training Research: An Introduction
Michael Gessler, Sandra Bohlinger, Olga Zlatkin-Troitschanskaia

International Curriculum Comparison in Vocational Education and Training: A Collaborative Development of an Analysis Instrument
Pujun Chen, Anastasia Goncharova, Matthias Pilz, Dietmar Frommberger, Junmin Li, Olga Romanova, Yueru Lin

Measuring Quality in Indian VET Institutions: Development Steps Towards a Framework Adapted to the National Context
Muthuveeran Ramasamy, Julia Regel, Harshil Sharma, Anjana Rajagopalan, Matthias Pilz

Cooperation Between Learning Venues and its Limits: The Hotel Industry in Cancún (Mexico)
Beke Vogelsang, Natascha Röhrer, Martina Fuchs, Matthias Pilz

Social Representation of Non-Academic Work in Mexico in the Light of Cultural Artefacts
Ute Clement, Paola García Fuentes, Stefan Gold, Claudia Hunink, Lydia Raesfeld

Mapping Research on European VET Policy With a Systematic Literature Review Method: A Pilot Study
Ianina Scheuch, Sandra Bohlinger, Anne Bieß, Hoang Long Nguyen

Research in International Transfer of Vocational Education and Training – A Systematic Literature Review
Miriam Toepper, Olga Zlatkin-Troitschanskaia, Carla Kühling-Thees

Scoping Review on Research at the Boundary Between Learning and Working: A Bibliometric Mapping Analysis of the Last Decade
Michael Gessler, Christof Nägele, Barbara E. Stalder

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Vocational Students' Ways of Handling the Academic/Vocational Divide

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Abstract

Purpose: The focus of this article is on Swedish vocational students' own thoughts about different types of knowledge and how these thoughts relate to the forming of their vocational identities. The article reports on a study which investigates how vocational students handle the division between theoretical and practical knowledge as they learn to become skilled industrial workers. Theoretical and practical knowledge are often presented as dichotomies in a hierarchy, where theoretical knowledge is more highly valued than practical knowledge. The division between theoretical and practical knowledge is known in research as "the academic/vocational divide". This divide is particularly relevant to vocational students, as they need to deal with both types of knowledge as they navigate between the contexts of school and work.

Methods: This study is part of a research project on vocational students' learning and identity formation. The empirical material is based on qualitative interviews with 44 students enrolled on the industrial programme at Swedish upper secondary schools.

Findings: The study revealed three different ways in which vocational students handled the academic/vocational divide: Placing higher value on practical knowledge than on theoretical knowledge, reinforcing the separation between school and work, and selecting theoretical subjects as useful tools for the future.

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Conclusions: Two conclusions drawn from the study are that students are aware of the status differences and divisions between practical and theoretical knowledge, and that they handle the academic/vocational divide in an active manner. Students make choices that will help them form a vocational identity or that will give them opportunities for further education and alternative careers. This article challenges and contradicts the image of vocational students as unmotivated and unintellectual, instead portraying them as knowledgeable actors who make strategic choices for their future and are active in forming vocational identities within vocations that require deep and advanced knowledge.

Keywords: Vocational Identity, Industrial Programme, Academic/Vocational Divide, VET, Vocational Education and Training

1 Introduction

All modern societies are influenced by an academic/vocational divide in some way (Young, 1993). At a societal level, the academic/vocational divide relates to aspects such as class and gender, and reveals a lot about hierarchies and status related to different kinds of knowledge and work (Niemi & Rosvall, 2013; Rose, 2008). Vocational education has been accused of reproducing class by preparing working–class students for a working–class future (Arum & Shavit, 1995). When it comes to gender, working class masculinities are generally viewed as being incompatible with theoretical knowledge (Niemi & Rosvall, 2013). Theoretical knowledge has a higher status within the world of education, while practical knowledge enjoys a higher status within the world of work. Vocational education is circumscribed by both these partly competing sources of status (Billett, 2014).

Additional contradictions have been ascribed to the historical tension between the "outsider perspective" on vocational education, e.g. among power elites in society with a distant view of practical knowledge, and the "insider perspective", i.e. those actors that are engaged in skilled work and vocational education (Billett, 2014). In this article, the focus is on the "insider perspective", i.e. the student perspective, including how various kinds of knowledge are valued, transformed and recontextualised by students as they alternate between workplaces and school (Evans et al., 2011). When students are at school, they are subject to the academic/vocational divide as an institutionalised part of the education system. This divide is manifested in the physical contexts of schools, where vocational education and academic education are often located in different buildings or parts of the school (Nylund et al., 2018). Even within vocational education, the academic/vocational divide is present through a clear separation of vocational and general subjects (Nylund et al., 2018). This separation, together with the different logics that schools and workplaces operate with, present a challenge for

students who are expected to integrate knowledge learned at school with knowledge from the workplace (Baartman et al., 2018).

This study is informed by timely research demonstrating how vocational students integrate knowledge between school and workplaces (Berner, 2010; Gustavsson & Persson Thunqvist, 2018; Persson Thunqvist & Axelsson, 2011) when learning their vocations. Different types of knowledge become relevant for vocational students (Rose, 2008) as they navigate between the contexts of school and workplaces. Students need to make sense of and recontextualise (Evans et al., 2011) the meaning and relevance of theoretical and practical knowledge in the field of tension between the world of school and the world of work. However, there is little research on how vocational students learning to become industrial workers use and change knowledge between school and work. Therefore, this study aims to investigate how vocational students handle the division between theoretical and practical knowledge as they learn to become skilled industrial workers.

Forty–four vocational students on the industrial programme at Swedish upper secondary schools were interviewed about theoretical and practical knowledge, how they learn vocational skills and the industrial vocation. Vocational education refers to Swedish upper secondary programmes that prepare students for working in specific vocations, while academic education refers to preparatory programmes for higher education or post–secondary academic education. In Swedish vocational education, theoretical knowledge comprises both general theoretical subjects and theoretical vocational subjects. In this paper, both types of theoretical subjects are referred to as "theoretical knowledge". In contrast to theoretical knowledge, practical knowledge here refers to knowledge practised in the schools' workshops, or during workplace–based learning at companies.

The paper continues by outlining the theoretical framework, which includes the concept of recontextualisation for analysing students' learning and use of knowledge in and between school and workplace contexts. Thereafter, previous research on the academic/vocational divide and its implications for vocational students' vocational learning is presented. The theoretical section is followed by a presentation of the Swedish upper secondary school system for vocational education, with a particular focus on the industrial programme. The method section describes the data collection and analysis. Thereafter, the findings are presented in three different themes that reveal students' ways of handling the divide between theoretical and practical knowledge. Finally, the findings are discussed, and the paper ends with conclusions and some practical implications of the study.

2 Theoretical Framework

In this section, the concept of recontextualisation is presented. The concept of recontextualisation was selected to provide a way of analysing the students' learning and knowledge use in and between school and workplace contexts. Thereafter, research on the academic/vocational divide and its impact for vocational students is described.

2.1 The Concept of Recontextualisation

The concept of recontextualisation describes the process of using knowledge gained from one context in another context (Evans et al., 2011). When various types of knowledge move between different contexts, for example the contexts of school and workplaces, it is not simply a matter of transfer, but rather a process of changing knowledge, context and people (Evans et al., 2010). What constitutes a context is broadly interpreted by Evans et al. (2011) and includes schools of thought as well as geographic places. Norms and traditions of different communities can also be understood as contexts (Evans et al., 2011). Both theoretical and practical knowledge are, from the perspective of recontextualisation, viewed as contextualised (Evans et al., 2011). Hence, Evans et al. (2011) challenge the view that theoretical knowledge, unlike practical knowledge, lacks links to specific contexts, which is a view that has contributed to the low status of practical knowledge and has further widened the theory–practice gap.

Furthermore, this perspective highlights the potential of the workplace as a locus for knowledge production and learning (Evans et al., 2011). Thus, recontextualisation is a way to handle the academic/vocational divide that shows the equal value of both theoretical and practical knowledge (Evans et al., 2011). In addition, it is impossible in reality to distinguish between theoretical and practical knowledge, as work often requires theoretical knowledge which cannot be separated from practical knowledge (Niemi & Rosvall, 2013).

Knowledge gained at school needs to be changed and integrated with other types of knowledge in workplaces to become useful to students (Evans et al., 2011). However, the type of knowledge that is valued at school differs from the type of knowledge that is prioritised at workplaces (Gustavsson & Persson Thunqvist, 2018). Gustavsson and Persson Thunqvist (2018) found that school provides vocational students with knowledge that may facilitate their workplace–based learning, where the students' skills are further developed as they participate in daily work with more experienced co–workers. The students' participation in daily work with other workers is also important for the development of vocational identities, as they are mediated by the norms, ideals and values from both work and school. Identifying bridges between these contexts is therefore important for vocational students who move between school and the workplace (Evans et al., 2011).

During workplace–based learning, students put both theoretical and practical knowledge to use while learning their intended vocation, which is an important part of their vocational identity formation (Gustavsson & Persson Thunqvist, 2018). Hence, the recontextualising of knowledge can be viewed as a process that is closely connected to vocational identity formation (Evans et al., 2011). Vocational identity is here understood as a desire to live up to the norms and ideals of a vocation (Armishaw, 2007), while being able to express motivation for entering that specific vocation (Evans et al., 2010).

2.2 The Academic/Vocational Divide in Vocational Education

Within previous research on vocational education, two different but interconnected strands of research are particularly relevant for this study: Research on the boundary between theoretical and practical knowledge, and research on the low status of vocational education relative to academic education and how to overcome the difference in status.

Firstly, concerning the boundary between theoretical and practical knowledge, Schaap et al. (2012) suggest that vocational education is governed by two different rationalities; on one hand the rationality of school, and on the other hand the rationality of workplace–based learning. The rationality of school is associated with theoretical knowledge, while practical knowledge is connected to the rationality of workplace–based learning. Vocational students need to integrate their experiences from the workplace with what they learn at school and vice versa (Baartman et al., 2018) in order to form a vocational identity (Gustavsson & Persson Thunqvist, 2018). As Aarkrog (2005) points out, both theoretical and practical knowledge are crucial for developing vocational competence, even though they are often being portrayed as conflicting perspectives.

Secondly, regarding the status of vocational education in comparison with academic education, Chankseliani et al. (2016) illustrate how a combination of theoretical and practical knowledge is often suggested as a way to address the status differences between academic and vocational education. However, efforts to overcome these status differences by integrating different types of knowledge still tend to place a greater value on theoretical knowledge by expecting it to strengthen and complement practical knowledge, and never the other way around (Hyland, 2002; Rose, 2008). An alternative way to overcome this status hierarchy is to stop comparing different types of education and knowledge, and to focus instead on the value of vocational education in itself by reinforcing vocational skills and expertise (Chankseliani et al., 2016). In addition, Hyland (2002) suggests that, in order to overcome these status differences between theoretical and practical knowledge, it is crucial to show the learning potentials of vocational education that contains deep, advanced and continuous learning, rather than merely focusing on pinpointing similarities between vocational and academic education.

2.3 The Academic/Vocational Divide – Implications for Vocational Identities and Learning

Research on vocational education has demonstrated how the academic/vocational divide has important implications for vocational students' identities and thus their learning. It has shown how vocational students are positioned in at least two different social identities. On the one hand, in the dominant historical and educational discourse about the academic/vocational divide (see e.g. Billett, 2014), vocational students are positioned as non–academics, lacking the intellectual capacity for theoretical work. On the other hand, vocational students are positioned as (becoming) skilled workers, following advanced and demanding vocations that require deep knowledge. Hence, while the former social categorisation implicates a negative identification, associated with the formation of marginalised school identities, the latter connotes a process of identification with future–oriented vocational identities; it challenges one–dimensional conceptions of the academic/vocational divide in the context of modernised forms of vocational education targeting skilled vocations (see Billett, 2014).

The image of vocational students as non–academic learners has been shown to be shared by both vocational students themselves and their teachers (Brockmann & Laurie, 2016; Rosvall et al., 2017). In the classroom, the image of vocational students as being unmotivated for theoretical general knowledge results in low expectations from teachers, which subsequently leads to passive, low achieving students (Rosvall et al., 2017). Vocational education is often viewed as an option for students who are uninterested in and incapable of acquiring academic knowledge (Nylund et al., 2017), while academic education is recommended to students with higher grades (Tønder & Aspøy, 2017). In addition, low achievers from comprehensive school are often guided towards vocational education, rather than academic education (Rosvall et al., 2017). The students' interpretations of their own capabilities leave them feeling less intelligent than their peers who are studying more academic educations (see Rose, 2008). Atkins and Flint (2015) found that vocational students themselves say that they are considered to be stupid for choosing the vocational track over the academic. A common criticism of vocational education is that it only provides short–term and context–dependent knowledge (Beicht & Walden, 2015).

Another strand of research challenges this notion that vocational students are unmotivated low achievers in the classroom, and instead focuses on the deep and complex knowledge they possess as skilled workers (e.g. Billett, 2014; Rose, 2008). In line with this, a recent study shows that deep and advanced vocational knowledge is important for shaping vocational students' learning trajectories towards vocations in the industrial sector (Ferm et al., 2019).

This view of vocational students possessing advanced knowledge through work is a view that contrasts with images of vocational students as unmotivated and unintelligent, and instead demonstrates the complicated processes of problem solving (Rose, 2008) and the high level of conceptual knowledge (Billett, 2014) that vocational knowledge comprises. In

line with this perspective, the vocational students themselves tend to place high value on their education, even though they are aware of the low status ascribed to it in comparison with academic programmes (Atkins & Flint, 2015). In addition, they often express a sense of contempt towards more academic forms of education and knowledge (Rose, 2008).

However, previous research has indicated that the learning that takes place at school can be a valuable knowledge base for vocational students as they enter the workplace (Kilbrink et al., 2014; Rintala & Nokelainen, 2019) and can also function as a springboard to a vocation (Gustavsson & Persson Thunqvist, 2018). In addition, Swedish vocational education requires for pass grades in several theoretical subjects in order for students to receive a vocational qualification. Slaats et al. (1999) found that students' own motivation to study vocational education is often related to general goals concerning their future vocation, and their vocational qualification is viewed as a way to reach that goal.

Furthermore, vocational students tend to perceive theoretical courses or knowledge as useful when it is directly applicable to their work (Schaap et al., 2012). Both vocational students and their teachers want to see more integration between theory and practice. However, the curriculum and examination forms are presented as a challenge to this (de Bruijn & Leeman, 2011), and the workplace offers limited opportunities to show students the connections between theory and practice due to the requirements for effective production (Kilbrink et al., 2018). Hence, vocational students often experience weak links between theory and practice (Rintala & Nokelainen, 2019). Presenting vocational education as an entity requires close cooperation between the school and the workplace (FitzSimons & Boistrup, 2017), and it is argued that students need to see their education as a whole in order to understand the value of theoretical knowledge (Kilbrink et al., 2014). This study focuses on how vocational students handle the division between theoretical and practical knowledge as they learn to become skilled industrial workers in the contexts of both school and work, which has rarely been examined in earlier research.

3 Research Context

The Swedish upper secondary school system consists of 18 programmes: Six higher education preparatory programmes and twelve vocational programmes. In the vocational programmes, the tension between theoretical and practical knowledge is visible in the way vocational education policies have alternated between prioritising general and workplace–related knowledge (Persson Thunqvist et al., 2019). The two most recent reforms in Swedish upper secondary education have switched between prioritising general theoretical knowledge and workplace–based learning. The 1994 reform aimed to increase vocational students' general knowledge by expanding vocational education and providing the students who completed it with general eligibility for higher education (Virolainen & Persson Thunqvist, 2017).

In the 2011 reform, the pendulum swung in the other direction as the goal was to leave students better prepared for the labour market by increasing workplace–based learning (Persson Thunqvist et al., 2019). The 2011 reform is often portrayed as prioritising market value and the needs of the labour market (Nylund et al., 2017). The stronger focus on workplace–based learning than on general theoretical knowledge in vocational education was motivated as an attempt to prevent unemployment and problems with young people dropping out of upper secondary school (Andersson et al., 2015). However, the decreasing general theoretical knowledge in vocational education is also suggested to lead to fewer opportunities for lifelong learning than academic education (Lavrijsen & Nicaise, 2017).

The vocational education examined in this article is the industrial programme, one of the 12 vocational upper secondary programmes. As with all Swedish upper secondary education, the industrial programme lasts for three years. The industrial programme has four different directions, all of which prepare students for different vocations in the industrial sector. Potential vocations after the programme include welder, machine operator, process operator and operating technician. As with all other Swedish upper secondary vocational education, the industrial programme includes a set of mandatory general theoretical subjects such as mathematics, English, Swedish, history and religion. In addition, it also gives students the option to study the additional courses in mathematics, Swedish and English that are required for general eligibility for higher education. All vocational education also includes several vocational subjects. On the industrial programme, these include chemical and mechanical production processes, production development and welding.

Like all other Swedish upper secondary vocational programmes, the industrial programme is offered as two different models: either as school–based vocational education or in the form of an upper secondary apprenticeship. Both models share the same subjects and learning goals; they differ only in respect of the amount of time spent on workplace–based learning. The school–based model must include at least 15 weeks of workplace–based learning, while no less than half of the entire education time in the apprenticeship model should comprise workplace–based learning. The role of the workplace is twofold during the workplace–based learning: It continues to be a place for production, while also functioning as a learning environment for vocational students. Students are entitled to supervisors during their workplace–based learning, and they are there under the supervision of their schools.

4 Method

This study of vocational students' ways of handling the academic/vocational divide, is a part of a larger research project focusing on industrial students' learning and identity formation during their workplace–based learning.

This sub-study was conducted by the author. A qualitative research methodology was employed. Data was gathered by conducting semi–structured interviews with 44 students enrolled in the industrial programme at Swedish upper secondary schools.[1]

4.1 Selection of Participants

To gain access to the students, the principals responsible for the industrial programmes were contacted with information about the research study. The principals then communicated with the students enrolled on the schools' industrial programmes and the selected students participated in the interviews voluntarily. An important criterion for the selection of students was that they had experiences of workplace–based learning within the industrial sector. The participating students were between 18 and 20 years old. Thirty–three were boys and 11 were girls. The sample has a relatively high percentage of female students in relation to students commonly enrolled on the industrial programme. Eight students were in the second year of the programme, while the remaining 36 were in their third and final year. Students from both the school–based model and the apprenticeship model were interviewed. The students came from six different schools which collaborated with local small, medium–sized and large industrial companies located near the schools.

4.2 Data Collection

The interviews were conducted by the author and two other researchers who were involved in the overall research project. The three researchers all had experience of conducting qualitative interviews. The interviews with the students took place at the schools and lasted for about one hour each. To ensure coherence between the researchers, a semi–structured interview guide was used and the first interviews were carried out in pairs of researchers to calibrate the questions asked and their follow–up in the interview situation. The interview guide contained questions about different ways of learning industrial work, as well as the value and meaning of theoretical knowledge and practical knowledge. All interviews were transcribed verbatim.

4.3 Data Analysis

Each interview transcript was repeatedly read in order to gain familiarisation with the material. The next step entailed identification of expressions of the students' views of theoretical knowledge – both general subjects (such as mathematics and English) and theoretical voca-

1 This sub–study is part of the abovementioned research project, which has been approved by the Regional ethics board in Linköping (ref. 2014/438–31).

tional subjects (such as welding). All the individual pieces of information about the students' views of the theoretical courses were collected in one document and were thereafter analysed in relation to one another. The students often compared theoretical knowledge to practical knowledge, and the context of school with the context of workplace–based learning. In the new document, the material was sorted into the following categories:

1. The students' views of the relevance or irrelevance of theoretical and practical knowledge.
2. The students' views of the relevance or irrelevance of aspects of theoretical knowledge.
3. The students' views of their own and other industrial students' conditions for learning theoretical and practical knowledge.
4. The reasons the students gave for choosing, or not choosing, to study the optional theoretical courses that lead to eligibility for higher education.
5. The connection (or lack of connection) that the students found between theoretical and practical knowledge.

In a second round of analysis, the empirical material under categories 1–5 was compared. During this phase of analysis, three themes emerged showing how students handle the academic/vocational divide. These themes are placing higher value on practical knowledge than on theoretical knowledge, reinforcing the separation between school and workplaces, and selecting theoretical subjects as tools for the future.

5 Findings

The findings are presented in the form of the three different themes, each representing a way in which vocational students on the industrial programme handled the academic/vocational divide by using theoretical and practical knowledge.

5.1 Placing Higher Value on Practical Knowledge Than on Theoretical Knowledge

One way in which the students handled the academic/vocational divide was to place higher value on practical than on theoretical knowledge. The students described themselves as practically oriented people who prefered workplace–based learning to classroom learning at school.

> I think it's much more fun to be out on workplace–based learning than being in school. I learn a lot more because I know what everything I do is used for.

Studying theoretical knowledge at school, such as reading course literature and carrying out various written tasks, could even be viewed as a hindrance to the students' acquisition of practical skills at workplaces.

> I like to do things practically. It's a bit like it doesn't exist if it's on paper, but if I have it in front of me it's easier to understand.

The industrial students sometimes handled the divide by arguing that it was possible to manage the vocational workplace activities without any theoretical knowledge but not without practical knowledge; therefore, the practical knowledge was more highly valued. The valuing and mastering of practical knowledge may be interpreted as a crucial aspect of forming a vocational identity as a skilled industrial worker. In the students' ways of arguing for the higher value of practical knowledge compared to theoretical knowledge, they also handled the divide by emphasising that it was more important to know how to do the work than to understand the theory behind it.

> You can manage to weld without knowing the theory, but if you only know the theory and are not able to weld well, you can't exactly work with it.

The students' valuing of practical knowledge was also expressed in what they said about further education. Further studies were viewed as a second choice if they were to face an uncertain labour market and unemployment, or if they wanted to change career path.

> If I change my mind or if I can't get a job, I will still have something to do while I'm unemployed – I can go to school.

The industrial programmes' courses that gave general eligibility for higher education often created a conflict of interest for the students. In order to have the opportunity to participate in these courses, they often needed to take time away from their scheduled workplace–based learning. This choice presented a dilemma between the students' ambitions to prove their engagement at industrial workplaces and preparing themselves for alternative future options. Faced with this dilemma, the majority of the students chose the workplace–based learning rather than studying the courses that provided general eligibility. Therefore, they postponed alternative plans to continue to higher education, instead prioritising the vocational route that strengthened their vocational identity. As the students placed higher value on practical knowledge than on theoretical knowledge, they also expressed identification and loyalty with the workplace.

5.2 Reinforcing the Separation Between School and Workplaces

The students talked about school and the workplace as two completely different contexts. According to the students, the workplace valued concrete practical knowledge rather than abstract, general theoretical knowledge which was associated with school.

> R: What was it like getting used to it in the beginning, how to behave in the workplace and things like that?
>
> S: Well, in the beginning I thought it was a bit strange, almost a little nervous. Now it's no problem, it feels natural.
>
> R: Can you give an example of that?
>
> S: Well, it was a long time ago, I just know that I felt different, very different.
>
> R: Different from school?
>
> S: Yes? … I only know that it was completely different from school.

The separation between school and the workplace was also evident in what the students said about the differences between vocational and higher education preparatory programmes; the programmes were located in different buildings or on different sides of the school. The students also separated activities performed at school and those performed at workplaces, which were perceived as "doing something for real". The students' alignment with the ideals of the workplace can be seen as a sign of their identification with the world of work rather than the world of school. The student quoted below compares a school with a strong focus on workplace–based learning to a school with more theoretical knowledge, and argues that the former is a better environment for learning the vocation.

> Well if you look at for example (name of another school), they sit behind a school bench and read about welding for the whole of the first grade, and then they have a workshop where they can do some welding. And then they maybe do workplace–based learning for two weeks, then they're back at school for two weeks, and they continue like that. What kind of insight do they get into real working life? Well I think that we get more of the practical knowledge, but their welding technique and everything that they have read about may be better. But I think you gain more from being out (at workplace–based learning) from the beginning and seeing 'this is what it's like'.

The students' separation of school and work created distance between the students on the industrial programme, whom they identified as workers, and the students on higher education preparatory programmes, whom they viewed as theoretical learners. The students associated studying theoretical knowledge with the school context, and they sometimes viewed it as the opposite of working and living a real life.

> To just sit and write and study things that are totally unnecessary to know. I'm so sick of it, I just want to get rid of it, get out there and make money instead, finally start living.

The students viewed practical knowledge as being connected to their reality, while theoretical knowledge was generally defined as studying unnecessary subjects. Furthermore, the students rarely described the integration between theoretical subjects and practical knowledge. However, when the value of theoretical knowledge was mentioned in the interviews, it mostly concerned the subjects of mathematics and English.

5.3 Selecting Theoretical Subjects as Tools for the Future

The students selected and made use of theoretical knowledge that supported their workplace–based learning. This meant that they handled the academic/vocational divide by attributing meaning not only to practical knowledge, but also to theoretical knowledge that they thought was useful for mastering a vocation and forming a vocational identity. The students spoke about theoretical knowledge as being useful in (at least) two different ways. The first involved using theoretical knowledge as a tool to achieve their chosen industrial vocation, while the second involved using theoretical knowledge as a tool for further studies.

The first way that students found theoretical knowledge to be useful was to gain access to a vocational future within industry. The students described mathematics, Swedish and English as important subjects to obtain a vocational qualification, and hence crucial for their vocation as industrial workers.

> Our vocational qualification here, well it means a lot, to have a pass grade in maths, Swedish, English and… we have another course that's called 'Man and industry', which we are studying now. I think they all automatically become really important to manage.

The students described mathematics as being useful in order to calculate measurements and geometries in the workplace. One student reflected on how some of the older workers struggled in the workplace because they lacked mathematical knowledge.

> Some older workers there (at the workplace–based learning) haven't had the same education in maths that we get today. And they're always standing with a calculator, scratching their heads…

Language skills in English (and sometimes in Swedish) were also required in the workplace to be able to read product descriptions and other work instructions during workplace–based learning.

> I can imagine that English skills are good to have because a lot of tools have English descriptions on them and, well, if you want to be a travelling assembler, English can be useful.

The students also described knowledge of English as useful when meeting foreign customers and business partners. Theoretical subjects other than English, mathematics and theoretical vocational subjects were sometimes also stressed as being relevant for learning the vocation as skilled industrial workers. For example, students said that in history and civics, knowledge about history and politics connected to industrial work were meaningful in order to gain a contextual understanding of the industry and industrial development.

Theoretical vocational subjects learned at school were important in the sense that they were used by the students to appear knowledgeable in the workplace and not look stupid in front of their colleagues.

> About half of what I've learned at school is from the workplace–based learning, from doing it for real, not just on paper. But the knowledge I gained at school before entering the workplace has also played a significant role.

The second way that students spoke about theoretical knowledge as being useful was as a tool for proceeding to higher education. Some students saw that theoretical knowledge was like a bridge to higher education or an alternative future career.

> S: I have chosen to study extra subjects because it opens up possibilities for quite a lot of things, if you want to continue studying, for example I could become a nurse, a speech therapist or something like that.
>
> R: But working as a nurse or a speech therapist, that's quite different from industrial work?
>
> S: Yes, it's very different, but I felt it could be something that I could maybe become when I'm older or really tired of industrial work all of a sudden, then I still have other options.

The students who chose to study extra courses for general eligibility to higher education wanted to keep the door open for a possible future career change.

> I want to become a firefighter, so I need to study Swedish and civics 2, I think. Some students in my class have chosen courses in maths, Swedish and English. If they were to study more later, which I don't think they will, but if they want to, they wouldn't have to go to municipal adult education and take more courses.

Hence, theoretical knowledge could be used both to live up to the requirements of an industrial vocation and to deal with an uncertain future.

6 Discussion

The findings of this study show that the students handled the academic/vocational divide in three different ways: by placing a higher value on practical rather than theoretical knowledge; by reinforcing the difference between practical and theoretical knowledge; and by defining some subjects such as mathematics and English as useful for their future, and other subjects as completely irrelevant knowledge. Firstly, by placing a higher value on practical knowledge than on theoretical knowledge, the students turned the status hierarchy upside down (see also Atkins & Flint, 2015). The students thereby changed the meaning of the academic/vocational divide; this implies that the meaning of theoretical knowledge gained in the school context was interpreted as being less valuable than the workplace–based learning. The students highlighted the advanced, deep knowledge involved in their workplace–based learning rather than focusing on finding similarities with preparatory programmes for further education in order to overcome the status hierarchy (see Hyland, 2002). In addition, the vocational students tended to devalue the type of knowledge offered on preparatory programmes for higher education (see Rose, 2008). Here, the recontextualisation was manifested as a sense–making process in which the vocational students valued practical knowledge, and in which they shifted the norms and traditions of school towards the norms and traditions of the world of work. Society's general view of practical knowledge as being less valued (e.g. Billett, 2014) was challenged and opposed by the students, who instead ascribed a higher status to this type of knowledge in the context of vocational education.

Secondly, the students both acknowledged and reinforced a separation between school and work that was already institutionalised within society in general as well as within the education system (Schaap et al., 2012). This separation was reinforced by the way that the students talked about the completely different knowledge valued at the school and in the workplace. They also spoke about how academic and vocational education was separated into different buildings (Nylund et al., 2018) and into activities carried out at school or in the workplace. In their separation of school and work, the students emphasised the workplace–based learning and practical knowledge as being connected to the real world and real life, in a way that school and theoretical knowledge were not. The contexts of school and the workplace implied more than just geographical settings; they were also interpreted as different sets of norms and traditions (Evans et al., 2011). Hence, the education was not perceived as an entity, which may prevent students from appreciating the value and utility of theoretical knowledge (Kilbrink et al., 2014).

The students actively formed vocational identities by aligning with the norms and traditions of the workplace rather than those of school, and they viewed the logics of school and work as completely different to each other (Schaap et al., 2012). This can be interpreted as a rational response to the institutional settings of vocational education, where theoretical and practical knowledge are separated and the goal is to prepare students for a future within a

specific vocation. Furthermore, in the context of vocational education, the students reinforced the differences between theoretical and practical knowledge to such a degree that the knowledge types seemed to completely lack connections to one another. Aligning with the norms and ideals of industrial workplaces, the vocational students recontextualised theoretical knowledge as being completely separate from the world of work. The students' alignment with the world of work and how workplaces valued theoretical and practical knowledge can be interpreted as crucial elements of their vocational identification formation as industrial workers. This separation can also be interpreted as a response to the tensions and lack of integration between practical and theoretical knowledge presented by their education, even though vocational competence actually requires both types of knowledge (Aarkrog, 2005).

Thirdly, it is interesting to note the somewhat contradictory fact that students not only reinforced the separation of practical and theoretical knowledge, but also bridged the divide between theory and practice by selecting theoretical knowledge that they viewed as being useful for their vocational future. This was a way of integrating the context of school with the context of the work, which also seemed to be relevant for the students' learning trajectories in relation to their vocational identity formation within the industrial sector (Ferm et al., 2019).

The theoretical knowledge from the context of school that the students deemed to be particularly useful was courses in mathematics and English, which could be used in the workplace. The students put knowledge from school to use during their workplace–based learning, and some theoretical subjects were more useful for achieving a desired future. As Aarkrog (2005) notes, both practical and theoretical knowledge are crucial for learning a vocation. However, regardless of how much the school focused on the usefulness of theoretical knowledge in industrial workplaces, the students themselves selected the types of knowledge that were useful for doing the job together with more experienced workers at workplaces. Real–life workplace situations invoked theoretical knowledge, activated it and changed it so it could be integrated with the current workplace context (see Evans et al., 2011). This could be the case when students read instructions in English in the workplace, or when they had to calculate measurements in their work.

To conclude, the students' ways of handling the academic/vocational divide were thus connected to their learning trajectories (Ferm et al., 2019) in the form of future plans and careers. Within industrial vocations, certain theoretical knowledge such as mathematics and English were required in order to be able to handle the daily work, while other types of theoretical knowledge could instead be used to gain eligibility for further education in the future. Hence, the students related to vocational identities in different ways as they put theoretical knowledge to use in their skilled industrial work or used knowledge to keep the door open for alternative vocational identities in the future.

Regarding their future transitions to employment after completing the industrial programme, the students often stressed the importance of a vocational qualification. To obtain

this qualification, it was necessary to get a pass grade in several theoretical courses on the industrial programme. The students often described this qualification as a crucial goal in order to get an industrial job or change their career path, which motivated them to do what was required to achieve it (see also Slaats et al., 1999). However, the students were rarely motivated to do anything beyond the general requirements, as it was the vocational qualification that mattered and not the grade. This is a logical way of reasoning, as vocational students have the opportunity to study the courses needed for general eligibility for higher education, either during the vocational programme or later, through further education. Hence, they had adjusted to the institutional conditions and handled them by aligning with work as their prioritised alternative. This is consistent with their identification as industrial workers rather than students.

7 Conclusions and Practical Implications

This study has contributed knowledge about how students handled the academic/vocational divide by recontextualising knowledge between the contexts of school and the workplace in a way that facilitated the formation of a vocational identity as industrial workers. The students handled the academic/vocational divide as knowledgeable actors by changing its meaning, placing more value on practical rather than theoretical knowledge. They also reinforced the separation between the logics and activities connected with school and work. Furthermore, the students saw the importance of having some theoretical knowledge as they recontextualised it as a tool for their future, by selecting knowledge that they perceived as being valuable in industrial workplaces or for proceeding to higher education.

From the findings of this study, I draw two conclusions about how vocational students handle the academic/vocational divide. The first conclusion is an awareness of the low status of vocational education and practical knowledge in dominant discourses on education and knowledge within society. Hence, the students' response is a consequence of the pervading institutionalised rationality of an academic/vocational divide in society. As a result of a deeper analysis, a second conclusion can be drawn that portrays the students as active actors, making conscious choices in order to become employable industrial workers or to proceed with alternative careers in the future.

The students' valuation and prioritisation of practical knowledge and their selection of useful theoretical knowledge is to be understood as an active alignment with the world of work and a rational response to the requirements of the labour market. The students are aware of what kind of knowledge is needed in order to become a skilled and employable industrial worker, and they therefore prioritise and select that knowledge. Hence, they bridge the academic/vocational divide by bringing together practical and theoretical knowledge that is relevant for forming an identity as a skilled industrial worker in the workplace. They are also

knowledgeable about the requirements and options for gaining eligibility through continuing education, to keep the door open to further education and alternative careers.

A potential limitation of this study could be that the students' experiences are examined in the context of Swedish vocational education, which in many respects differs from vocational educations in other Nordic and European countries, especially considering the large role the school plays in Swedish vocational education (Persson Thunqvist et al., 2019). This study, however, questions the view of vocational students as primarily unmotivated, incapable and uninterested non–academics, which may also be highly relevant to vocational education in other countries. It highlights the insider perspective by showing vocational students to be knowledgeable actors in the process of becoming skilled industrial workers in vocations that require deep and complex knowledge. The students' valuation and selection of different types of knowledge is a strategy chosen by them as knowledgeable actors, actively forming identities aligned with their prospective vocations in industrial work.

References

Aarkrog, V. (2005). Learning in the workplace and the significance of school–based education: A study of learning in a Danish vocational education and training programme. *International Journal of Lifelong Education, 24*(2), 137–147. https://doi.org/10.1080/02601370500056268

Andersson, I., Wärvik, G. B., & Thång, P. O. (2015). Formation of apprenticeships in the Swedish education system: Different stakeholder perspectives. *International Journal for Research in Vocational Education and Training, 2*(1), 3–4. https://doi.org/10.13152/IJRVET.2.1.1

Armishaw, D. D. (2007). Vocational Identity: It's about Working at Becoming. *College Quarterly, 10*(2), 1–13. https://collegequarterly.ca/2007-vol10-num02-spring/armishaw.html

Arum, R., & Shavit, Y. (1995). Secondary vocational education and the transition from school to work. *Sociology of Education, 68*(3), 187–204. https://hdl.handle.net/1814/16905

Atkins, L., & Flint, K. J. (2015). Nothing changes: Perceptions of vocational education in England. *International Journal of Training Research, 13*(1), 35–48. https://doi.org/10.1080/14480220.2015.1051344

Baartman, L. K., Kilbrink, N., & de Bruijn, E. (2018). VET students' integration of knowledge engaged with in school–based and workplace–based learning environments in the Netherlands. *Journal of Education and Work, 31*(2), 204–217. https://doi.org/10.1080/13639080.2018.1433821

Beicht, U., & Walden, G. (2015). How socially selective is the German system of initial vocational education and training? Transitions into initial vocational training and the influence of social background. *Journal of Vocational Education & Training, 67*(2), 235–255. https://doi.org/10.1080/13636820.2014.983955

Berner, B. (2010). Crossing boundaries and maintaining differences between school and industry: Forms of boundary–work in Swedish vocational school. *Journal of Education and Work, 23*(1), 27–42. https://doi.org/10.1080/13639080903461865

Billett, S. (2014). The standing of vocational education: Sources of its societal esteem and implications for its enactment. *Journal of Vocational Education & Training, 66*(1), 1–21. https://doi.org/10.1080/13636820.2013.867525

Brockmann, M., & Laurie, I. (2016). Apprenticeship in England–the continued role of the academic–vocational divide in shaping learner identities. *Journal of Vocational Education & Training, 68*(2), 229–244. https://doi.org/10.1080/13636820.2016.1143866

Chankseliani, M., James Relly, S., & Laczik, A. (2016). Overcoming vocational prejudice: How can skills competitions improve the attractiveness of vocational education and training in the UK? *British Educational Research Journal, 42*(4), 582–599. https://doi.org/10.1002/berj.3218

De Bruijn, E., & Leeman, Y. (2011). Authentic and self–directed learning in vocational education: Challenges to vocational educators. *Teaching and Teacher Education, 27*(4), 694–702. https://doi.org/10.1016/j.tate.2010.11.007

Evans, K., Guile, D., Harris, J., & Allan, H. (2010). Putting knowledge to work: A new approach. *Nurse Education Today, 30*(3), 245–25. https://doi.org/10.1016/j.nedt.2009.10.014

Evans, K., Guile, D., & Harris, J. (2011). Rethinking work–based learning: For education professionals and professionals who educate. In M. Malloch, L. Cairns, K. Evans & B. O'Connor (Eds.), *The Sage handbook of workplace learning* (pp.149–161). Sage. http://dx.doi.org/10.4135/9781446200940.n11

Ferm, L., Persson Thunqvist, D., Svensson, L., & Gustavsson, M. (2019). Vocational students' identity formation in relation to vocations in the Swedish industrial sector. *Nordic Journal of Vocational Education and Training, 9*(2), 91–111. https://doi.org/10.3384/njvet.2242-458X.199291

FitzSimons, G. E., & Boistrup, L. B. (2017). In the workplace mathematics does not announce itself: Towards overcoming the hiatus between mathematics education and work. *Educational Studies in Mathematics, 95*(3), 329–349. https://doi.org/10.1007/s10649-017-9752-9

Gustavsson, M., & Persson Thunqvist, D. (2018). Students' vocational learning: Enabling conditions for putting knowledge to work. In S. McGrath, M. Mulder, J. Papier, & R. Suart (Eds.), Handbook of vocational education and training: *Developments in the changing world of work* (pp. 1–18). Springer. https://doi.org/10.1007/978-3-319-94532-3_52

Hyland, T. (2002). On the Upgrading of Vocational Studies: Analysing prejudice and subordination in English education. *Educational Review, 54*(3), 287–296. https://doi.org/10.1080/0013191022000016338

Kilbrink, N., Bjurulf, V., Baartman, L. K., & de Bruijn, E. (2018). Transfer of learning in Swedish technical vocational education: Student experiences in the energy and industry programmes. *Journal of Vocational Education & Training, 70*(3), 455–475. https://doi.org/10.1080/13636820.2018.1437064

Kilbrink, N., Bjurulf, V., Olin–Scheller, C., & Tengberg, M. (2014). Experiences of educational content in Swedish technical vocational education: Examples from the energy and industry programmes. *International Journal of Training Research, 12*(2), 122–131. https://doi.org/10.1080/14480220.2014.11082035

Lavrijsen, J., & Nicaise, I. (2017). Returns on vocational education over the life cycle: Between immediate labour market preparation and lifelong employability. *International Review of Education, 63*(2), 257–280. https://doi.org/10.1007/s11159–017–9630–9

Niemi, A. M., & Rosvall, P. Å. (2013). Framing and classifying the theoretical and practical divide: How young men's positions in vocational education are produced and reproduced. *Journal of Vocational Education & Training, 65*(4), 445–460. https://doi.org/10.1080/13636820.2013.838287

Nylund, M., Rosvall, P. Å., Eiríksdóttir, E., Holm, A. S., Isopahkala–Bouret, U., Niemi, A. M., & Ragnarsdóttir, G. (2018). The academic–vocational divide in three Nordic countries: Implications for

social class and gender. *Education Inquiry, 9*(1), 97–121. https://doi.org/10.1080/20004508.2018.1424490

Nylund, M., Rosvall, P. Å., & Ledman, K. (2017). The vocational–academic divide in neoliberal upper secondary curricula: The Swedish case. *Journal of Education Policy, 32*(6), 788–808. https://doi.org/10.1080/02680939.2017.1318455

Persson Thunqvist, D., & Axelsson, B. (2011). "Now It's Not School, It's For Real": Negotiated Participation in Media Vocational Training. *Mind, Culture and Activity, 19*(1), 29–50. https://doi.org/10.1080/10749039.2011.632048

Persson Thunqvist, D., Hagen Tønder, A., & Reegård, K. (2019). A tale of two reforms: Institutional change in vocational education and training in Norway and Sweden in the 1990s. *European Educational Research Journal, 18*(3), 298–313.https://doi.org/10.1177/1474904118823104

Rintala, H., & Nokelainen, P. (2019). Vocational Education and Learners' Experienced Workplace Curriculum. *Vocations and Learning*, 13, 1–18. https://doi.org/10.1007/s12186–019–09229–w

Rose, M. (2008). Intelligence, knowledge, and the hand/brain divide. *Phi Delta Kappan, 89*(9), 632–639. https://doi.org/10.1177/003172170808900905

Rosvall, P. Å., Hjelmér, C., & Lappalainen, S. (2017). Staying in the comfort zones–Low expectations in vocational education and training mathematics teaching in Sweden and Finland. *European Educational Research Journal, 16*(4), 425–439. https://doi.org/10.1177/1474904116669154

Schaap, H., Baartman, L., & De Bruijn, E. (2012). Students' learning processes during school–based learning and workplace learning in vocational education: A review. *Vocations and Learning, 5*(2), 99–117. https://doi.org/10.1007/s12186-011-9069-2

Slaats, A., Lodewijks, H. G., & van der Sanden, J. M. (1999). Learning styles in secondary vocational education: Disciplinary differences. *Learning and Instruction, 9*(5), 475–492.

Tønder, A. H., & Aspøy, T. M. (2017). When work comes first: Young adults in vocational education and training in Norway. *International Journal for Research in Vocational Education and Training, 4*(3), 270–288. https://doi.org/10.13152/IJRVET.4.3.5

Virolainen, M., & Persson Thunqvist, D. (2017). Varieties of universalism: Post–1990s developments in the initial school–based model of VET in Finland and Sweden and implications for transitions to the world of work and higher education. *Journal of Vocational Education & Training, 69*(1), 47–63. https://doi.org/10.1080/13636820.2016.1238836

Young, M. (1993). Bridging the academic/vocational divide: Two Nordic case studies. *European Journal of Education, 28*(2), 209–214. https://pascal-francis.inist.fr/vibad/index.php?action=getRecordDetail&idt=3996566

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Returns to Workplace Training for Male and Female Employees and Implications for the Gender Wage gap: A Quantile Regression Analysis

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Abstract

Context: Existing studies have explored the association between workplace training and wages suggesting that training participation may have a positive association with wages. However, we still know very little about whether this association varies between men and women. Through its potential positive association with wages, training may balance wage differences between men and women. In addition, the gender wage gap varies across the wage distribution. Differences in the association between training participation and wages for men and women across the earnings spectrum may offer an explanation as to why the discrepancy in female/male earnings is larger at some point of the wage distribution compared to others.

Approach: Using data from the Programme for International Assessment of Adult Competencies (PIAAC) and unconditional quantile regression, this paper examines whether the association between workplace training and wages differs between men and women at different points of the wage distribution across 14 European countries. To partly control for endogeneity in training participation, detailed measures of cognitive skills have been included in the models.

Findings: Findings show gender differences in the association between training and wages across the wage distribution. In most countries, results indicate larger training coefficients for women than men at the lower end of the wage spectrum whereas they are larger for men

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at the top. This pattern holds across most countries with the only exception of Liberal ones, where women benefit less than men across the entire wage spectrum.

Conclusions: The findings of this work reveal that distributional variations in returns to workplace training follow a similar pattern across industrialized countries, despite their different institutional settings. Moreover, differences in training coefficients of men and women at different parts of the wage distribution suggest that training could reduce gender wage differences among low earners and potentially widen the gap in wages among individuals at the top of the wage distribution.

Keywords: Vocational Education and Training, Gender Differences, Unconditional Quantile Regression, Cross-National Comparison

1 Introduction

A wide body of research has explored differences in workplace training participation by gender. Whilst earlier studies show that men are more likely to participate compared to women (Avis, 2018; Blundell et al., 1996; Evertsson, 2004; Pischke, 2001), more recent ones suggest that this long-lasting trend has reversed and, nowadays, females have higher chances to take part in training compared to their male counterparts (e.g. Dammrich et al., 2016; Dieckhoff & Steiber, 2011; Jones et al., 2008; O'Halloran, 2008; Simpson & Stroh, 2002). These findings raise questions about whether the job rewards often associated with workplace training participation are also gendered. In particular, existing studies have explored the association between workplace training and wages suggesting that training participation may have a positive association with wages (Arulampalam & Booth, 2001; Blundell et al., 1999; Ehlert, 2017; Gerfin, 2004). However, we still know very little about whether the association between training and wages varies between men and women. One reason for this is that research on the topic is somewhat gendered. Although a substantial body of literature has been generated around the topic of workplace training returns, existing research has largely focused on the experience of males (e.g. Arulampalam et al., 2004; Arulampalan & Booth, 2001; Gerfin, 2004). Hence, empirical evidence on whether also women benefit from participation in workplace training is lacking.

The study of differences in returns to workplace training between men and women has important implications for social inequalities, for example related to the difference in median pay between men and women, the so-called gender wage gap. While on the decline in many countries, the gap is a persistent feature of virtually every nation's labour market (Blau & Kahn, 2003). Explaining this gap has attracted much attention and existing studies on the topic are numerous (see e.g., the international evidence in Blau & Kahn, 1996, 2003). Nevertheless, scholars still debate its underlying causes. Furthermore, research on gender wage

differences has identified that the gap varies significantly across the wage distribution. Yet, findings are inconclusive. Whilst some studies show a tendency for that to be higher at the top (Albrecht et al., 2003; Huffman, 2004), others found larger gaps at the bottom (Arulampalam et al., 2007; Christofides et al., 2013; Nicodemo, 2009). Differences in the association between training participation and wages for men and women across the earnings spectrum may offer an explanation as to why the discrepancy in female/male earnings is larger at some point of the wage distribution compared to others. Yet, whether the association between training and wages varies between men and women has been under-researched and, to date, no existing study explored whether it differs across the wage distribution. To the best of the author's knowledge, only Arulampalan et al. (2010) examined how workplace training returns vary along men's wage spectrum in ten European countries. The current study advances current research by considering also their female counterparts.

Cross-country comparative work concerned with gendered labour market behaviour has stressed that institutional settings have an influence on women's opportunities in the labour market (e.g. Dieckhoff & Steiber, 2011; Grönlund & Magnusson, 2016; Wozny & Schneider, 2014). For example, literature on the gender gap in training participation indicates that it differs considerably across countries thus suggesting that country-specific institutional arrangements shape differences in participation between men and women (Dämmrich et al., 2016; Dieckhoff et al., 2007; Wozny & Schneider, 2014). Similarly, they may explain gender differences in other labour market outcomes connected to training, such as wages. In this paper, the study of the distributional gender gap in training effects across countries is related to variations in welfare state regimes. To do that, we borrow from an approach that links gender-specific labour market outcomes to welfare state interventions (Mandel, 2012). Mandel (2012) analyses the extent to which family policies contribute to the economic gains of women and emphasizes that family policy should not be expected to uniformly benefit women of different classes. In fact, the mechanisms by which welfare state policies have been found to affect women's labour market attainments are by nature linked to their skills and position in the labour market. This perspective is extended in this paper to explain gender differences in training wage effects along the wage distribution in diverse contexts.

This article explores gender differences in the wage outcomes associated with training. Specifically, it addresses the following research questions: Do workplace training wage returns differ between men and women across the wage distribution? If so, do they vary across countries? The empirical evidence is drawn from 2012 data for 14 European countries from the Programme for International Assessment of Adult Competencies (PIAAC) and unconditional quantile regression (UQR). The interest of this study is to investigate training events that happen at the workplace, after labour market entry. The definition of training available in PIAAC data suggests that training refers to formal courses of instruction, rather than informal on-the-job training (Organisation for Economic Co-operation and Development

[OECD], 2013). Given the cross-sectional nature of the PIAAC data, this analysis seeks to describe gendered patterns in the association between workplace training and wages and not to disentangle causal effects.

2 A Gendered Approach in the Study of Workplace Training Returns

An extensive literature has investigated the effect of training participation on wages, and offers evidence that training might improve the wages of those who participate, although results vary substantially across types of training and the related skills gained, as well as countries. Existing studies suggest that general skills training (e.g. to maintain occupational standards) is associated with higher productivity (Barret & O'Connel, 2001) and wage returns (Jones et al., 2011; Luchinskaya & Dickinson, 2019), while this is not the case for specific training (e.g. induction training). Research on soft skills (for instance, communication, cooperation) also indicates that these are associated with significant wage returns (for a review, see Balcar, 2014). In the UK, estimated returns to training range from 1% (Booth, 1993) to 18% (Booth, 1991). Positive effects of training on wages are found for Norway (1% increase; Schøne, 2004), Switzerland (2%; Gerfin, 2004), and Portugal (3%; Budria & Pereira, 2007). The results for Germany are less clear, when confronting the finding of no return of Pischke (2001) and a 5% increase of Mühler et al. (2007). Similarly, evidence is inconclusive in France (no return in Goux & Maurin, 2000; positive return for job switchers in Fougère et al., 2001). Due to different concepts and definitions of training across countries and datasets, the comparability of results across countries is limited. A few studies circumvent some of these limitations by exploiting cross-country data (see OECD 1999, 2004). Bassanini et al. (2007) estimate a positive impact of training on earnings for most of the analysed countries; this return ranges from 3.7% for the Netherlands to 21.6% for Greece and is sensitive to the statistical method employed.

Although existing evidence suggests that training participation may improve individuals' wages, only a few studies have investigated whether this association varies by gender. Brunello (2001) and the OECD (2004) found lower wage returns to training for women, whereas some country studies found no difference, or even the opposite pattern (for a review, see Hansson, 2008). Triventi and Barone (2014) found that women, on the whole, benefit more than men from participation in adult learning activities. Through its positive association with wages, workplace training might have a role in reducing wage differences and may be a key policy intervention to tackle difference in wages between men and women. Research on the gender wage gap also indicates that it is not equal across groups, but it is largest among the highly educated (Evertsson et al., 2009), and in high-prestige occupations (Magnusson, 2010). Similarly, existing studies have shown that it is not constant across the wage distribution (Albrecht et al., 2003; Arulampalan et al., 2007; Christofides et al., 2013; Huffman, 2004;

Nicodemo, 2009). These findings suggest that causes of gender inequality vary across individuals with different characteristics. Previous literature on the association between training participation and wages has mainly examined whether it exists on average. Yet, individuals have different capabilities to adapt to participation in training: some of them may exploit the skills acquired through training more than others thereby generating differences in the related wage effects.

Existing literature maintains that workplace training has a positive effect on wages for several reasons: first, from a human capital perspective, it provides specific skills that increase productivity and, in turn, wages (Becker, 1962); second, participation in learning is a signal of high motivation and job involvement (signalling approach, Spence, 1973), which is positively rewarded by employers. Finally, training participation provides certificates needed for promotion to higher ranked positions (credentialist approach, Collins, 1979) (for a review, see Minello & Blossfeld, 2017). Despite widely used to explain differences in economic payoff deriving from training, these approaches have been challenged on several sides by other social science disciplines as well as by scholars within the same field of economics. For instance, feminist economists have taken the distance from this position (for a discussion, see England & Folbre, 2003). In particular, economic perspectives have been criticised for their inability to properly account for the impact of skills on wage outcomes. Existing research has pointed out that the human capital perspective alone cannot explain wage differentials but it needs to be considered alongside other economic, social and institutional factors, such as collective agreements and awards (Oliver, 2016). Economic theories, moreover, do not offer a comprehensive framework to assess the impact of workplace training on wages of men and women. One major limitation has been their failure to explain or critique gender-based inequality and norms (Watts, 2003). Gender wage differences may, thus, be better explained by considering the presence of occupational segregation and statistical discrimination in the labour market.

Occupational segregation is understood as the different distribution of men and women across occupational categories and industries where women tend to be confined in lower paid jobs (Weeden & Sørensen, 2004). Empirical studies have shown that occupational segregation is related to the gender wage gap (Dolado, 2003; England et al., 2007) and there is a common agreement in the literature that occupations with predominance of females suffer from a wage penalty (e.g. Perales, 2013) and slower wage growth (e.g. Olsen & Walby, 2004). Lower remuneration in female-dominated occupations may also constrain the payoff consequent to workplace training participation. According to statistical discrimination (Arrow, 1973) instead, because information is costly to obtain, employers often rely on beliefs about group-level differences in factors related to productivity or other work-related traits. Due to gender-specific roles and family constraints, women tend to have more discontinuous careers than men; therefore, they are usually considered less attached to work and less productive. In

contrast, men usually have more continuous participation in the labour market; this leads to greater investment in their working career. For the reasons deriving from both occupational segregation as well as discrimination, it seems plausible to expect women to experience lower rewards to training than men. In addition, these dynamics may differ across the earnings spectrum. Although Arrow's (1973) original formulation of statistical discrimination was assumed to apply equally to all workers, it is likely to be particularly detrimental for women with high human capital resources, who are likely to also have higher earnings potential and prestige. Existing research shows that the wage return to occupational prestige is higher for men than for women; for example, Magnusson (2009) finds that the gender difference in payoff to prestige is especially pronounced in the upper part of the prestige distribution, among high earners. The skewed division of family duties, in fact, makes it more difficult for women than men to have wage promoting job characteristics in high-prestigious occupations (Magnusson, 2010; Blair-Loy, 2003). This means that, even when women and men achieve similar occupational prestige, the payoff to prestige is higher for men (Magnusson, 2009).

Taken together, the outlined mechanisms indicate that women should benefit less from training and that the association between training and wages should vary between men and women along the wage distribution. Specifically, if we assume that statistical discrimination is more detrimental for women in highly prestigious (and highly paid) positions, we should expect women to benefit less than men at the top (Hypothesis 1).

2.1 Cross-Country Variation in Gendered Returns to Workplace Training

Comparative studies on gendered labour market behaviour have shown that institutional settings have an influence on women's opportunities in the labour market in several dimensions (e.g. Dieckhoff & Steiber, 2011; Grönlund & Magnusson, 2016; Wozny & Schneider, 2014). For example, Wozny & Schneider (2014) find that a system of vocational education and training (VET) and skills geared towards firm-specific skills enhances the female training gap. Similarly, institutional differences may affect gender differences in workplace training returns.

Overall, institutional regulations can affect the economic value of training via wage policies and collective bargaining. Centralised wage bargaining, for example, is aimed at reducing variation in wages (Badescu et al., 2011). It can, therefore, be expected that formal adult education is also associated with less income variation in these countries. Although a substantial number of existing studies confirm that wage-setting institutions affect the level of wage inequality overall (Blau & Kahn, 1996, 2003; Mandel & Semyonov, 2005), no comprehensive framework exists that assesses variations in the association between training and wages by gender across countries. In this paper, differences between men and women across the wage distribution are related to differences across welfare states interventions and family

policies. This approach has been borrowed by Mandel (2012), who tackles the study of gender wage inequalities by offering new insights on how welfare states policies interact with socio-economic positions. Her argument is extended in this paper to motivate why gender differences in training rewards should vary across the wage distribution in different contexts. In her work, Mandel (2012) maintains that the impact of welfare state interventions on women's earnings and, in turn, on the gender wage gap is conditioned by class. For example, she suggests that extensive family policies which are aimed at favouring labour market reconciliation may also institutionalise work interruptions. While the latter favour low skilled women, they also increase statistical discrimination, which is likely to hurt highly educated and career oriented women the most. Or, similarly, centralised wage bargaining systems favour low earning women by reducing wage dispersion, because women are more likely than men to be low paid. However, centralised wage setting institutions are not of any interest to highly educated and high earning women, because these institutions compress wages; this may reduce the wages which these women may reach and, additionally, raise the cost of outsourcing domestic services. Following from this, it is plausible to expect high earning women to benefit less than high earning men from training participation in countries with more developed welfare systems (Hypothesis 2).

Based on the welfare regimes and Varieties of Capitalism classifications (Esping-Andersen, 1999; Hall & Soskice, 2001), countries in this paper belong to four main groups. These classifications distinguish countries on the basis of the generosity of the welfare states and range from those who offer more extensive state policies, to those characterised by a minimal role of the state: 1. Social Democratic (Norway, Denmark, Finland); 2. Conservatives and Central European (Belgium, France, Germany, the Netherlands); 3. Post-Socialists and Eastern European (Czech Republic, Slovak Republic, Poland); 4. Southern European (Italy, Spain); 5. Liberal (Ireland, the UK).

3 Data, Sample and Empirical Strategy

This paper uses data from the Programme of International Assessment of Adult Competencies (PIAAC). This dataset is particularly suitable for this analysis for two main reasons. First, it provides cross-national comparable information on workplace training and on a wide range of background characteristics. Second, it includes an assessment of cognitive skills in three domains: literacy, numeracy, and problem solving in technology-rich environments, which is rarely contained in existing social surveys (domains are described in OECD, 2013). The analysis is based on the year 2012 and on 14 countries (listed in Table 1).[1] The sample includes individuals aged 18-65 who are in employment at the time of the survey. As wage regulations

1 Greece and Portugal are omitted due to gaps in the training data and because of the small estimating subsamples with usable information for those countries.

and training opportunities for employed individuals are different from self-employed, the latter have been excluded. Also students and those in paid apprenticeship have been dropped to rule out training forms that are not work-related. Final sample sizes are reported in the last column of Table 1. The countries used different sampling schemes in drawing their samples, but these were all aligned to known population counts with post-sampling weightings. Analyses employ sample weights in the estimations throughout.

3.1 Variables

The dependent variable is hourly wages. This variable in PIAAC data is defined as hourly earnings excluding bonuses for wage and salary earners.[2] Wage measures are used in its logarithmic form to interpret the results as estimated percent changes in hourly wages. As these are percentage effects, a similar coefficient across respondents' wage distribution would translate into larger absolute wage effects at higher points in the wage distribution.

The key independent variable is a measure of workplace training participation. Workplace training is defined as a training session organized in the workplace or provided by their supervisors or colleagues in the 12 months prior to the interview. According to the PIAAC definition, training sessions should be characterized "by planned periods of training, instruction or practical experience, using the normal methods of work" and include "training or instruction courses organized by the directors, managers or colleagues to help the respondent to do their job better or to familiarize them with their new tasks" (PIAAC survey questionnaire). The framing of the question suggests that the training responses should be interpreted as more formal courses of instruction, rather than informal on-the-job training (OECD, 2013).

Control variables have been chosen based on their likelihood to affect training returns and to vary by gender and are all coded according to standard, internationally comparable definitions. Education levels are defined according to UNESCO's International Standard Classification of Education (ISCED 1 to 6)[3], and account for differences across individuals' background to participate and benefit from training and for gender differences in educational attainment (Blossfeld et al., 2016). Age is added in its linear and quadratic form to account for differences across the life course. To account for differences in employment characteristics, models include dummies for occupation, part-time and firm size. The data on occupation is defined using the International Standard Classification of Occupations (ISCO-88) and it distinguishes between professional and managerial, clerks and technicians, machine and elementary workers. At last, information on skill levels is included; this information

2 In the PIAAC Public Use File, earnings data for Austria, Germany, and Sweden are reported only in deciles. Continuous wage information has been obtained from the German national data centre whereas it was not possible to obtain that from the other two countries which have been, therefore, excluded.

3 Respondents who obtained their highest educational qualification abroad are excluded because a high degree of measurement error on the educational attainment variable can be expected for these respondents (Schneider, 2018).

is used to control for –usually unobserved- differences between training and non-training participants. The relevance of this variable will be discussed further in the next section.

3.2 Analytical Strategy

To estimate the association between training and wages at different quantiles of the wage distribution, this paper uses unconditional quantile regressions (UQR) (Firpo et al., 2009). Unlike the conditional version developed by Koenker and Bassett (1978), the main advantage of the UQR method is that it allows for an analysis of the effect of small changes in the distribution of the independent variables on the unconditional quantile of the dependent variable, not conditional on the covariates included in models. UQR involves calculating a recentered influence function (RIF) to create a transformed dependent variable that can then be analysed using ordinary least squares (OLS) regression. The use of OLS in the second step allows effects to be interpreted as the impact at the specified quantiles when some constant increase in X is added to everybody's value of X, controlling for the other covariates (Firpo et al., 2009). In the case of a binary covariate (i.e. workplace training participation) the coefficient corresponds to a small increase in the probability of such covariate being equal to 1. Hence, the UQR coefficients of wages on training participation correspond to changes in the overall median wage caused by a small increase in the proportion of trained workers. The association between training participation and wages is estimated at the 10th, 25th, 50th, 75th, and 90th percentiles on a pooled sample of men and women. The model includes all the control variables listed above and an interaction term to explore whether the association between training and wages varies by gender.

3.3 Further Empirical Considerations

Selectivity and endogeneity bias are likely to affect the estimates of workplace training returns. The first refers to the different self-selection process within the group of men and women in the labour market while the second to the possibility of training and non-training participants to have different observed or unobserved characteristics. A few recent studies have attempted to account for sample selection when implementing quantile regression techniques (see e.g. Nicodemo, 2009). These studies have generally applied a semi-parametric adaptation of the Heckman parametric procedure for quantile wage regressions, as proposed by Buchinsky (1998). However, any selection correction within a quantile framework suffers from significant challenges, also with regard to the general issue of the validity of the instrument (to implement Heckman selection procedures). Hence, due to the lack of a good instrument in PIAAC data, this approach was excluded.

In the literature on training returns, the issue of training endogeneity is well known (e.g. Luchinskaya & Dickinson, 2019). The problem arises because training participation may not be random, but training participants may have different observed or unobserved characteristics compared to those who do not. In the absence of any corrections for the selection problem, estimated coefficients of the effect of training on wages are likely to be biased. Unconditional quantile regression does not take the presence of unobserved characteristics into consideration and this issue is likely to affect the estimates of this study.[4] Given the cross-sectional nature of PIAAC, it is not possible to control for stable unobserved differences among individuals. However, PIAAC includes information on individuals' skills level, usually not available in existing social surveys. A variable on numeracy skills[5] has been added with the aim to reduce the unobserved differences between those who participate in training and those who do not. This would increase the likelihood of the conditional independence assumption (CIA), which involves that participation in the program and the outcome are statistically independent for individuals with the same set of observable characteristics, to be satisfied. It is acknowledged that this approach does not overcome the problem of endogeneity, but it is a further step in that direction and it differentiates this work from previous studies. Unfortunately, despite the inclusion of a wide array of control variables as well as measures of skills level, the analyses performed in this paper do not fully account for unobserved differences between trained and untrained individuals; this does not permit any causal claims about the effect of training participation on wages. Moreover, unobserved characteristics (e.g. work norms) are also likely to be gender specific. This may affect the estimates for men and women differently. Dieckhoff et al. (2007) estimated separate models of training returns by gender and found –after accounting for selection – non-significant effects for both men and women. These results were valid for all the countries under analysis with the only exception of Germany. In the country, after correcting for selection, they still found a significant association between training and wages for men, but not for women. Although direct empirical investigations cannot be performed with PIAAC data, existing studies suggest that accounting for unobserved differences would reduce training estimates for both genders.

Another limitation of the analysis performed concerns the time when variables have been measured. Whilst all the variables were measured at the time of the interview, the variable on workplace training captures an event that occurred sometime during the past 12 months. Thus, it is uncertain whether the background characteristics were the same when that took place. This is particularly relevant with regard to the measures of skills level: if variables included to partially control for omitted factors are themselves affected by the variable of interest (i.e. training), we incur in the problem of proxy control (Angrist & Pischke, 2009).

4 Training endogeneity within a quantile regression framework can be tackled using the quantile treatment effects (Angrist & Pischke, 2009). However, this method relies on the use of instrumental variables and has been, therefore, excluded.

5 Drawing on Hanushek et al. (2013), this paper uses only information on numeracy skills, because of a higher comparability of numeracy skills across countries. Robustness checks have indicated no difference across measures of skills levels. Results available upon request.

Analyses show that training participation positively affects numeracy levels; therefore, estimates of training are expected to be downward biased.[6]

Another issue concerns the definition and time of measurement of training. The measurement of training may affect its associated reward. The human capital literature distinguishes between general and specific training based on who finances participation. This distinction is commonly used in the literature (e.g. Kauffman, 2015; McMullin & Kilpi-Jaconen, 2014). PIAAC contains detailed information on training financing. However, in PIAAC some respondents report that there are no costs involved in training participation presumably neglecting the costs borne by the employers. To correct for this, the variable has been recoded and the category "there were no costs" was incorporated to the employer financed category "yes, totally" (because costs borne by the employers are totally borne by them). After the recoding, the percentage of training financed by the employer adds to over 90%. Hence, this variable does not have enough variation to be informative and to allow for a distinction between employer- and employee-financed training. Also, the impossibility to identify when training took place before the interview generates a high heterogeneity in the time span between the measurement of training events and the interview, which may hinder the observation of the real association between training and wages.

4 Results

Descriptive statistics on a breakdown of the hourly wage distribution of men and women at different quantiles are displayed in Table 1. The q90/q10 ratio is used as a measure of income inequality as it compares the wage of the richest 10 percent and the poorest 10 percent (a ratio of 2 indicates that the top 10 percent earns twice as much as the bottom 10 percent). Overall, results confirm the presence of wage differences by gender across all countries, with men earning on average as well as across wage quantiles more than women. The 90/10 ratio ranges from about 1.1 to 1.7 in all countries and it is generally higher for men, thus indicating that the wage distribution is wider among men compared to women.

Table 2 shows training incidence across countries and average wage levels by participation status and by gender. Overall, participation rates range between 40 and 60% for men as well as women in all countries, apart from France and Italy where participation is below 30%. Figures reveal the presence of gender differences in wages when distinguishing between trained and untrained employees. On average, trainees earn more than those who have not received training (p-value of t-test < 0.05) across all countries, apart from men and women in Norway and women in the Slovak Republic.

6 Results available from the author upon request.

Table 1: Breakdown of log of Hourly Wage, by Wage Quantiles and Gender

Country	Gender	Mean	SD	10th	50th	90th	q90/q10	N
BE	Female	2.76	0.40	2.30	2.73	3.21	1.40	1,296
	Male	2.82	0.39	2.40	2.77	3.30	1.38	1,315
CZ	Female	4.59	0.48	4.09	4.61	5.05	1.23	1,163
	Male	4.81	0.48	4.32	4.81	5.32	1.23	1,188
DE	Female	5.16	0.34	4.80	5.16	5.52	1.15	1,992
	Male	5.25	0.41	4.86	5.23	5.69	1.17	1,963
FI	Female	2.71	0.34	2.34	2.68	3.14	1.34	1,458
	Male	2.87	0.36	2.45	2.84	3.37	1.38	1,466
FR	Female	2.45	0.40	2.05	2.39	2.96	1.44	1,782
	Male	2.56	0.38	2.17	2.49	3.06	1.41	1,781
GE	Female	2.54	0.49	1.95	2.54	3.14	1.61	1,396
	Male	2.73	0.52	2.05	2.74	3.35	1.63	1,456
IRE	Female	2.76	0.51	2.20	2.71	3.40	1.55	1,471
	Male	2.85	0.54	2.25	2.79	3.53	1.57	1,146
ITA	Female	2.33	0.46	1.75	2.27	2.86	1.63	888
	Male	2.38	0.45	1.85	2.33	2.99	1.61	965
NETH	Female	2.74	0.50	2.27	2.71	3.22	1.42	1,395
	Male	2.84	0.51	2.29	2.82	3.38	1.48	1,399
NO	Female	5.26	0.33	4.91	5.26	5.62	1.14	1,361
	Male	5.41	0.41	4.97	5.38	5.88	1.18	1,405
POL	Female	2.66	0.57	2.07	2.59	3.36	1.62	1,475
	Male	2.75	0.56	2.09	2.69	3.47	1.66	1,919
SLO	Female	1.59	0.50	1.24	1.47	2.12	1.70	649
	Male	1.76	0.76	1.24	1.55	2.30	1.85	845
ESP	Female	2.12	0.51	1.53	2.07	2.76	1.80	1,089
	Male	2.27	0.53	1.71	2.18	2.90	1.69	1,187
UK	Female	2.31	0.48	1.79	2.24	2.95	1.64	2,617
	Male	2.49	0.52	1.86	2.45	3.14	1.69	1,841

Note. Wages are measured in the countries' national currencies and transformed in logarithmic scale.

Table 2: Mean log of Hourly Wages for Trained and Untrained Individuals, by Gender

Country	Gender	Training Incidence (%)	Wage if Untrained	Wage if Trained
BE	Female	40.49	2.69	2.85
	Male	42.67	2.77	2.88
CZ	Female	49.44	4.49	4.70
	Male	58.98	4.76	4.85
DE	Female	54.66	5.10	5.21
	Male	50.99	5.20	5.29
FI	Female	66.74	2.59	2.77
	Male	58.13	2.77	2.94
FR	Female	28.06	2.41	2.55
	Male	25.78	2.54	2.62
GE	Female	46.17	2.42	2.68
	Male	48.39	2.59	2.87
IRE	**Female**	47.11	2.65	2.89
	Male	52.29	2.74	2.95
ITA	**Female**	24.13	2.28	2.46
	Male	23.50	2.35	2.47
NETH	**Female**	59.08	2.68	2.79
	Male	56.55	2.79	2.89
NO	**Female**	40.24	5.25	5.27
	Male	43.00	5.40	5.42
POL	**Female**	38.96	2.55	2.83
	Male	35.67	2.64	2.94
SLO	**Female**	40.97	1.57	1.62
	Male	42.63	1.71	1.81
ESP	**Female**	43.97	2.00	2.28
	Male	46.60	2.16	2.39
UK	**Female**	54.34	2.24	2.37
	Male	51.37	2.39	2.58

Note. Wages are measured in the countries' national currencies and expressed in logarithmic scale.

Table 3 presents estimates of training participation along the hourly wage distribution for each country and includes the interaction term between training and male (full models available in Appendix Tables A1-A14). As described in the methods section, endogeneity is not fully tackled in these models; this may affect the size and significance of training estimates across quantiles. The analysis of gender differences in workplace training returns at different quantiles of the wage distribution provides a detailed picture on the association between

training and wages. Results indicate a variation in size and significance of such association across the wage distribution, which would not be detected by an estimation at the mean. The direction of the association, however, differs across wage quantiles as well as countries.

The central argument of this paper is that the association between training and wages varies between men and women along the wage distribution, and that women are expected to benefit less than men particularly at the top (H1). In addition, Hypothesis 2 relates to differences across countries and suggests that high earning women gain lower benefits from training than men, especially in countries with developed welfare states, with policies aimed at helping reconciliation between work and family. Figure 1 shows UQR coefficients across countries (patterned bars indicated statistically significant differences)[7]. In most countries results show larger training coefficients for women than men at the lower end of the wage spectrum whereas they are larger for men at the top. In detail, the positive sign of the interaction at the upper tail suggests that men benefit from training more than women, thus supporting Hypothesis 1. However, it is worth noting that differences in coefficients of men and women reach statistical significance only in Denmark, Finland, Germany, Poland and the UK. Higher coefficients for men at the top of the wage distribution suggest that training participation may contribute to the widening of gender gap in wages among high earners. In contrast, at the lower end of the wage distribution, women show positive and significantly higher rewards compared to men. This finding indicates that participation in training and its rewards may reduce wage differentials between men and women at the lower end of the wage spectrum.

With regard to cross country variations, the second hypothesis of this paper suggests that high earning women should experience lower rewards from training compared to men especially in countries with developed welfare states. Results offer a partial support to this hypothesis. In the Social Democratic countries, women show smaller coefficients than men at the top and differences reach statistical significance at conventional levels (in Denmark and Finland, but not in Norway). These results partly fit the argument developed by Mandel (2012), who states that policy interventions aimed at reducing the gender wage gap affect women differently according to their socio-economic status. This argument would explain larger effects among women than men at the bottom, as they benefit from – for example – higher employment protection and family friendly policies. In contrast, these same policies negatively affect highly educated and high earning women. Although this explanation seems plausible for Social Democratic countries, a similar pattern seems to hold across countries thus offering little support to this hypothesis. Countries belonging to the Liberal group, such as the UK and Ireland, offer an exception to this overall pattern. In the latter countries, women benefit less than men across the entire wage distribution (although differences do not reach statistical significance at the lower end). This may indicate the high level of inequality

7 Full tables of results are available from the author upon request.

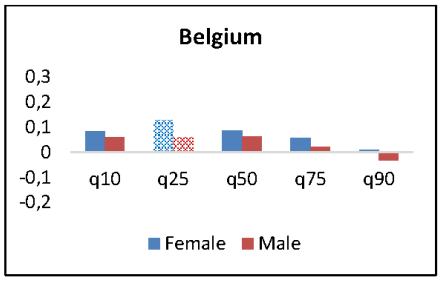
in such countries, at a disadvantage of women. In addition, it may reflect the scarcity of family policies that do not offer any support to working women.

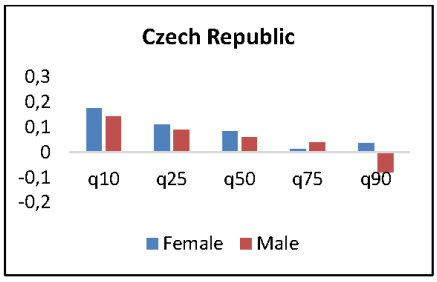
Table 3: UQR Coefficients of Workplace Training on Wages, by Gender

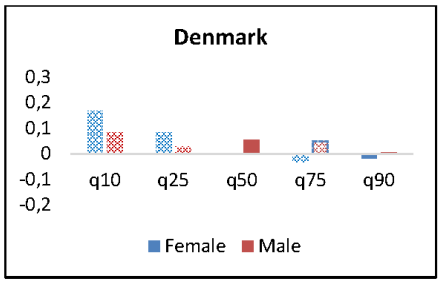
Country		q10	q25	q50	q75	q90
BE	**Training**	0.084***	0.127***	0.086***	0.056*	0.009
		(0.03)	(0.02)	(0.02)	(0.03)	(0.04)
	Training*male	-0.025	-0.069**	-0.023	-0.035	-0.041
		(0.04)	(0.03)	(0.03)	(0.04)	(0.06)
CZ	**Training**	0.175**	0.111**	0.083**	0.011	0.037
		(0.07)	(0.05)	(0.04)	(0.04)	(0.06)
	Training*male	-0.032	-0.022	-0.024	0.028	-0.117
		(0.09)	(0.07)	(0.06)	(0.05)	(0.10)
DE	**Training**	0.166***	0.084***	0.034**	-0.033*	-0.017
		(0.03)	(0.02)	(0.02)	(0.02)	(0.03)
	Training*male	-0.084**	-0.056**	0.019	0.082***	0.021
		(0.04)	(0.03)	(0.02)	(0.03)	(0.04)
FI	**Training**	0.142***	0.120***	0.047**	-0.0019	-0.021
		(0.03)	(0.02)	(0.02)	(0.02)	(0.03)
	Training*male	-0.079*	-0.066**	0.017	0.107***	0.150***
		(0.04)	(0.03)	(0.03)	(0.03)	(0.05)
FR	**Training**	0.078***	0.051***	0.049***	-0.019	-0.057
		(0.03)	(0.02)	(0.02)	(0.03)	(0.05)
	Training*male	-0.086**	-0.068***	-0.070**	0.020	0.019
		(0.03)	(0.02)	(0.03)	(0.04)	(0.07)
GE	**Training**	0.266***	0.232***	0.138***	0.076**	-0.010
		(0.05)	(0.04)	(0.03)	(0.03)	(0.03)
	Training*male	-0.125*	-0.051	0.015	0.078*	0.143***
		(0.07)	(0.05)	(0.04)	(0.04)	(0.06)
IRE	**Training**	0.010***	0.154***	0.117***	0.046	0.002
		(0.03)	(0.03)	(0.03)	(0.04)	(0.05)
	Training*male	-0.025	-0.071	0.0002	0.062	0.044
		(0.04)	(0.05)	(0.05)	(0.06)	(0.08)
ITA	**Training**	0.160***	0.127***	0.149***	0.080	0.065
		(0.05)	(0.04)	(0.04)	(0.06)	(0.10)
	Training*male	-0.058	-0.013	-0.056	0.052	0.066
		(0.07)	(0.05)	(0.05)	(0.08)	(0.15)
NETH	**Training**	0.106***	0.111***	0.083***	-0.000	-0.095***
		(0.04)	(0.03)	(0.02)	(0.03)	(0.04)
	Training*male	-0.040	-0.089**	-0.052	0.045	0.087

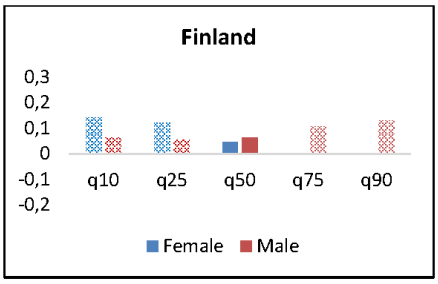
Country		q10	q25	q50	q75	q90
		(0.05)	(0.04)	(0.03)	(0.04)	(0.06)
NO	**Training**	-0.004	0.015	0.017	0.053**	0.010
		(0.03)	(0.02)	(0.02)	(0.02)	(0.03)
	Training*male	0.029	0.044*	0.038	-0.030	0.012
		(0.04)	(0.03)	(0.02)	(0.04)	(0.05)
POL	**Training**	0.109***	0.205***	0.155***	0.118**	-0.068
		(0.03)	(0.04)	(0.04)	(0.05)	(0.08)
	Training*male	-0.037	-0.104**	0.052	0.119*	0.214**
		(0.04)	(0.05)	(0.06)	(0.07)	(0.11)
SLO	**Training**	0.004	-0.020	-0.025	0.035	0.146
		(0.02)	(0.03)	(0.03)	(0.05)	(0.11)
	Training*male	0.00238	0.0680*	0.0941**	0.104	0.0648
		(0.03)	(0.04)	(0.04)	(0.08)	(0.16)
ESP	**Training**	0.173***	0.147***	0.098***	0.097**	0.006
		(0.04)	(0.04)	(0.03)	(0.05)	(0.06)
	Training*male	-0.116**	-0.040	0.037	0.102	0.098
		(0.05)	(0.05)	(0.05)	(0.06)	(0.08)
UK	**Training**	0.043	0.082***	-0.010	-0.041	-0.051
		(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
	Training*male	0.0128	-0.002	0.097**	0.137**	0.103
		(0.04)	(0.04)	(0.05)	(0.05)	(0.08)

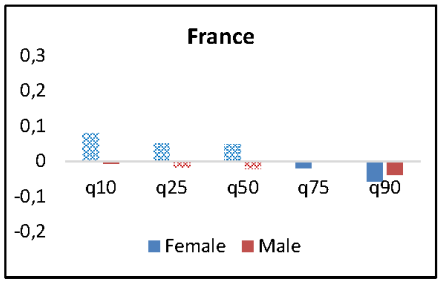
Note. * p<0.10, ** p<0.05, *** p<0.01

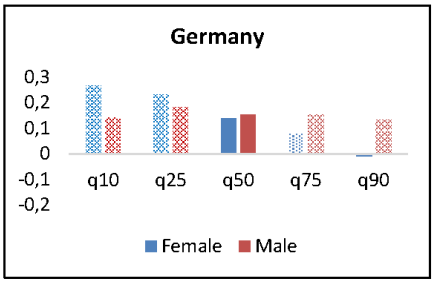

Belgium
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q90
Female
Male

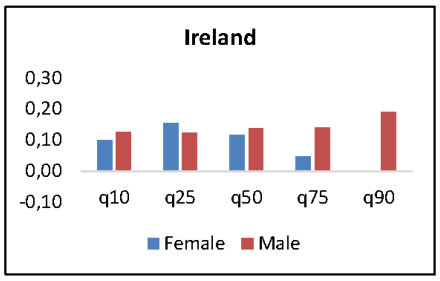

Czech Republic
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-0,2
q10
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q90
Female
Male

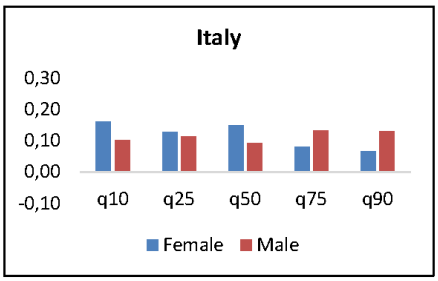

Denmark
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q50
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q90
Female
Male

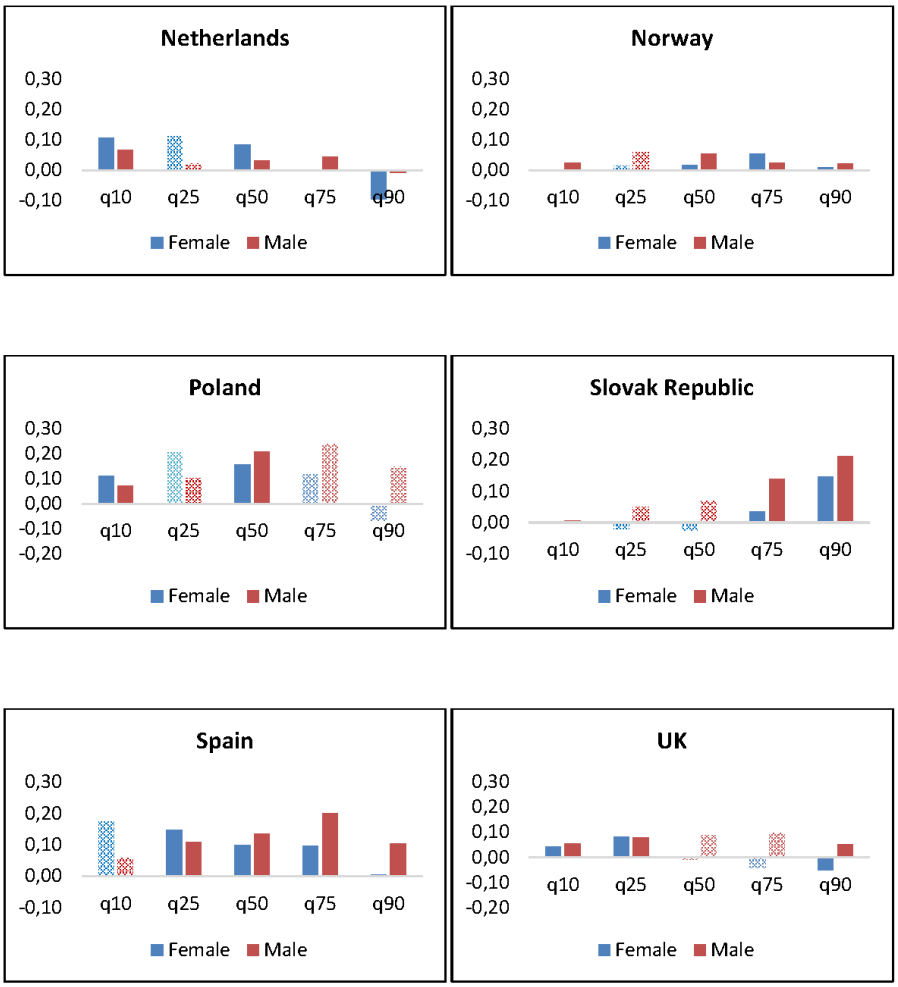

Finland
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-0,1
-0,2
q10
q25
q50
q75
q90
Female
Male


France
0,3
0,2
0,1
0
-0,1
-0,2
q10
q25
q50
q75
q90
Female
Male


Germany
0,3
0,2
0,1
0
-0,1
-0,2
q10
q25
q50
q75
q90
Female
Male


Ireland
0,30
0,20
0,10
0,00
-0,10
q10
q25
q50
q75
q90
Female
Male


Italy
0,30
0,20
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-0,10
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q75
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Female
Male



Note. Patterned bars indicate significant differences.

Figure 1: UQR Estimates of Training Participation on Wages, by Gender and Country

5 Conclusions

This paper has explored whether the association between workplace training and wages differs between men and women across the wage distribution. To date, research on gender differences in training rewards is scarce and, to the best of the author's knowledge, this is the first study to explore gendered patterns of training rewards within a quantile regression framework. Using comparative data from the PIAAC study, this article has extended the knowledge on gender differences in the wage effect of workplace training participation by investigating how they vary across the wage spectrum and across fourteen European countries. This paper assumed that women are rewarded less than men at the top of the wage distribution.

Moreover, drawing from the study of Mandel (2012), it argued that extensive welfare state interventions have different effects on women labour market outcomes, based on their socio-economic status.

In all, results confirm that a distributional approach provides further insights in the study of gender differences in training wage effects. Most countries display a statistically significant interaction effect between training and gender at different quantiles of the wage distribution, which would not be detected by an estimation at the mean. In detail, in most countries women have larger training coefficients than men at the lower end of the wage spectrum. This pattern is, however, opposite at the top of the wage distribution. This trend holds for all countries under observation, with the only exception of Liberal countries where women experience lower training benefits compared to men across the entire wage distribution. The finding of similar patterns across countries offers little support to the second hypothesis of this paper. The latter was drawn by considering the work of Mandel (2012), who maintains that the effect of welfare state interventions is conditioned by class, and that reconciliation policies are appropriate to all women in a similar manner. A second conclusion that can be drawn is that returns to workplace training for men and women follow a similar pattern across industrialized countries and that the institutional differences characterizing the four clusters of countries under examination are not fitted to describe them, at least with regard to returns to workplace training.

The results of this study have important policy implications. They show that women have larger training coefficients than men at the lower end of the wage spectrum whereas the size of coefficients is smaller at the top, among high earners. Overall, higher training effects for women at the lower end of the wage distribution across a considerable number of countries suggests that workplace training participation may lower the gap in wages between men and women in these contexts. Conversely, training may enlarge wage differences among high earners. There is an agreement in the literature that women invest more in training than men with regard to duration (O' Halloran, 2008) and financing (Burgard & Görlitz, 2014). If this holds also in the countries under investigation, lower returns for high earning women indicate a disadvantage for them: despite investing more than men, women are not rewarded to the same extent as men are. The exploration of differences in individuals' investment in training (in terms of, e.g., time and money) between men and women could shed additional light on possible variations in training returns between them. The lack of reliable information on training investments has not allowed addressing the investigation within this work; however, it is a fruitful avenue for future research. Lower training returns for women at the top of the wage distribution suggest that participation in training may widen the gender wage gap among high earners. This may be the result of higher discrimination among those who reach high earning positions. Policies aimed at increasing gender equality encompass issues such as work flexibility and paid parental leave. However, these do not appear to have lessened the

gender wage gap; rather, they may potentially exacerbate it if employers consequently avoid hiring women or reward them less due to costs incurred covering parental leave entitlements (Chang et al., 2014).

Overall, the findings of this study indicate that although workplace training participation has been argued to become increasingly necessary in order to reduce social inequalities (Kilpi-Jakonen et al., 2015), this may not be valid for all workers. Hence, current policy recommendations should not only focus on increasing participation rates but also pay greater attention to equality in terms of training outcomes. In fact, participation in training may not lead to a narrower gender wage gap if, as shown, women are rewarded less than men. To address this, policy debates should focus on new strategies to ensure that work of equivalent value is equally remunerated; this should happen regardless of the sex composition of the work force (Findlay et al., 2009). In relation to this latter point, exiting studies suggest that ad hoc responses to overcome gender segregation and attract more women into male-dominated trades should be developed in collaboration with a variety of actors involving industry, government and trade unions (Struthers & Strachan, 2019).

This study also has some limitations, which need to be acknowledged. First, because of cross-sectional nature of PIAAC data, it is not possible to establish any causal interpretation of the empirical associations. Nevertheless, results are robust to the introduction of a rich set of controls relating to socio-demographic and occupational characteristics, as well as to a detailed measure of cognitive skills. Second, as the analysis of proxy control indicates, the estimates of workplace training reported in this study suffer from downward bias.

References

Albrecht, J., Bjorklund, A., & Vroman, S. (2003). Is there a glass ceiling in Sweden? *Journal of Labour Economics, 21*(1), 145–177. https://doi.org/10.1086/344126

Angrist, J. D., & Pischke, J. (2009). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press. https://doi.org/10.2307%2Fj.ctvcm4j72

Arulampalan, W., & Booth, A. (2001). Learning and earning: Do multiple training events pay? A decade of evidence from a cohort of young British men. *Economica, 68*(271), 379–400. https://doi.org/10.1111/1468-0335.00252

Arulampalam, W., Booth, A., & Bryan, M. (2007). Is there a glass ceiling over Europe? Exploring the gender pay gap across the wages distribution. *Industrial and Labor Relations Review, 60*, 163–186. https://doi.org/10.1177/001979390706000201

Arulampalam, W., Booth, A., & Bryan, M. (2010). Are there asymmetries in the effects of training on the conditional male wage distribution? *Journal of Population Economics, 23*(1), 251–272. https://doi.org/10.1007/s00148-008-0209-4

Arrow, K. J. (1993). The theory of discrimination. In O. Ashenfelter & A. Rees (Eds.), *Discrimination in labor markets* (pp. 1–33). Princeton University Press. https://doi.org/10.1515/9781400867066-003

Avis, J. (2018). Crossing Boundaries: VET, the labour market and social justice. *International Journal for Research in Vocational Education and Training, 5*(3), 178–190. https://doi.org/10.13152/IJRVET.5.3.2

Badescu, M., D'Hombres, B., & Villalba, E. (2011). Returns to education in European countries. Evidence from the European community statistics on income and living conditions. JRC scientific and technical reports. Publications Office of the European Union. https://core.ac.uk/download/pdf/38621641.pdf

Balcar, J. (2014) Soft skills and their wage returns: Overview of empirical literature. *Review of Economic Perspectives, 14*(1), 3–15. https://doi.org/10.2478/revecp-2014-0001

Barrett, A., & O'Connell, P. J. (2001). Does training generally work? The returns to in-company training. *Industrial and Labor Relations Review, 54*(3), 647–662. https://doi.org/10.1177/001979390105400307

Bassanini, A., Booth, A., Brunello, G., De Paola, M., & Leuven, E. (2007). Workplace training in Europe. In G. Brunello, P. Garibaldi & E. Wasmer (Eds.), *Education and training in Europe* (pp. 8–13). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199210978.003.0009

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Journal of Political Economy, 70*(5), 9–49. https://doi.org/10.1086/258724

Blair Loy, M. (2003). Competing devotions: Career and family among women executives. *Journal of Marriage and Family, 67*(3), 782–783. https://doi.org/10.1111/j.1741-3737.2005.00170.x

Blau, F., & Kahn, L. (1996). Wage structure and gender earnings differentials: An international comparison. *Economica, 63*(250), 29–62. https://doi.org/10.2307/2554808

Blau, F., & Kahn, L. (2003). Understanding international differences in the gender pay gap. *Journal of Labor Economics, 21*(1), 106–144. https://doi.org/10.3386/w8200

Booth, A. (1991). Job-related formal training: who receives it and what is it worth? *Oxford Bullettin of Economics and Statistics, 53*, 281–294. https://doi.org/10.1111/j.1468-0084.1991.mp53003004.x

Booth, A. (1993). Private sector training and graduate earnings. *Review of Economics and Statistics, 75*(1), 164–170. https://doi.org/10.2307/2109642

Blossfeld, P. N., Blossfeld, G. J., Blossfeld, H. P. (2016). Changes in educational inequality in cross-national perspective. In M. Shanahan, J. Mortimer & M. Kirkpatrick Johnson (Eds.), *Handbook of the life course. Handbooks of Sociology and Social Research* (pp. 223–247). Springer. https://doi.org/10.1007/978-3-319-20880-0_10

Blundell, R., Dearden, L., & Meghir, C. (1996). *The determinants and effects of work related training in Britain*. London Institute of Fiscal Studies. https://doi.org/10.1920/re.ifs.1996.0050

Blundell, R., Lorraine, D., Costas, M., & Sianesi, B. (1999). Human capital investment: The returns from education and training to the individual, the firm and the economy. *Fiscal Studies, 20*(1), 1–23. https://doi.org/10.1111/j.1475-5890.1999.tb00001.x

Brunello, G. (2001). On the complementarity between education and training in Europe. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.273040

Buchinsky, M. (1998). The dynamics of changes in the female wage distribution in the USA: A quantile regression approach. *Journal of Applied Econometrics, 13*(1), 1–30. https://doi.org/10.1002/(sici)1099-1255(199801/02)13:1<1::aid-jae474>3.0.co;2-a

Budria, S., & Pereira, P. T. (2007). The wage effects of training in Portugal: Differences across skill groups, genders, sectors and training types. *Applied Economics, 39*(6), 787–807. https://doi.org/10.1080/00036840500447757

Burgard, C., & Görlitz, K. (2014). Continuous training, job satisfaction and gender: An empirical analysis using German panel data. *Evidence-based HRM, 2*(2), 126–144. https://doi.org/10.2139/ssrn.1914239

Chang, J., Connell, J., Burgess, J., & Travaglione, A. (2014). Gender wage gaps in Australian workplaces: Are policy responses working? *Equality, Diversity and Inclusion, 33*(8), 764–775. https://doi.org/10.1108/edi-10-2013-0080

Christofides, L. N., Polycarpou, A., & Vrachimis, K. (2013). Gender wage gaps, "sticky floors" and "glass ceilings" in Europe. *Labour Economics, 21*, 86–102. https://doi.org/10.1016/j.labeco.2013.01.003

Collins, R. (1979). *The credential society: An historical sociology of education and stratification*. New York Academic Press.

Dämmrich, J., Kosyakova, Y., & Blossfeld, H. P. (2016). Gender and job-related non-formal training: A comparison of 20 countries. *International Journal of Comparative Sociology, 56*(6), 433–459. https://doi.org/10.1177/0020715215626769

Dieckhoff, M., Jungblut, J. M., & O'Connell, P. (2007). Job-related training in Europe: Do institutions matter? In D. Gallie (Ed.), *Employment regimes and the quality of work* (pp. 77–103). Oxford University Press.

Dieckhoff, M. & Steiber, N. (2011). A re-assessment of common theoretical approaches to explain gender differences in continuing training participation. *British Journal of Industrial Relations, 49*, 135–157. https://doi.org/10.1111/j.1467-8543.2010.00824.x

Dolado, J., Felgueroso, F., & Jimeno, J. F. (2003). Where do women work? Analysing patterns in occupational segregation by gender. *Annales d'Economie et Statistique, 71/72*, 267–292. https://doi.org/10.2307/20079056

Ehlert, M. (2017). Who benefits from training courses in Germany? Monetary returns to non-formal further education on a segmented labour market. *European Sociological Review, 33*(3), 436–448. https://doi.org/10.1093/esr/jcx042

England, P., Allison, P., & Wu, X. (2007). Does bad pay cause occupations to feminize, does feminization reduce pay, and how can we tell with longitudinal data? *Social Science Research, 36*, 1237–1256. https://doi.org/10.1016/j.ssresearch.2006.08.003

England, P., & Folbre, N. (2003). Contracting for care. In M. A. Ferber & J. A. Nelson (Eds.), *Feminist economics today: Beyond economic man* (pp. 61–80). University of Chicago Press. https://press.uchicago.edu/ucp/books/book/chicago/F/bo3621956.html

Esping-Andersen, G. (1999). *Social foundations of postindustrial economies*. Oxford University Press.

Evertsson, M. (2004). Formal on-the-job training: A gender-typed experience and wage-related advantage? *European Sociological Review, 20*(1), 79–94. https://doi.org/10.1093/esr/20.1.79

Evertsson, M., England, P., Mooi-Reci, I., Hermsen, J., de Bruijn, J., & Cotter, J. (2009). Is gender inequality greater at lower or higher educational levels? Common patterns in the Netherlands, Sweden, and the United States. *Social Politics: International Studies in Gender, State & Society, 16*(2), 210–241. https://doi.org/10.1093/sp/jxp008

Findlay, P., Findlay, J., & Stewart, R. (2009). The consequences of caring: Skills, regulation and reward among early years workers. *Work, Employment and Society, 23*(3), 422–441. https://doi.org/10.1177/0950017009337057

Firpo, S., Fortin, N. M., & Lemieux, T. (2009). Unconditional quantile regressions. *Econometrica, 77*(3), 953–973. https://doi.org/10.3386/t0339

Fougère, D., Goux, D., & Maurin, E. (2001). Formation continue et carrières salariales. Une évaluation sur données individuelles. *Annales d'Économie et de Statistique, 62*, 49–69. https://doi.org/10.2307/20076281

Gerfin, M. (2004). Work-related training and wages: An empirical analysis for male workers in Switzerland. *IZA Discussion Paper* No. 1078. http://repec.iza.org/dp1078.pdf

Goux, D., & Maurin, E. (2000). Returns to firm-provided training: Evidence from French worker-firm matched data. *Labour Economics, 7*(1), 1–19. https://doi.org/10.1016/s0927-5371(99)00023-8

Grönlund, A., & Magnusson, C. (2016). Family-friendly policies and women's wages – is there a trade-off? Skill investments, occupational segregation and the gender pay gap in Germany, Sweden and the UK. *European Societies, 18*(1), 91–113. https://doi.org/10.1080/14616696.2015.1124904

Hall, P. A., & Soskice, D. (2001). *Varieties of Capitalism: The institutional foundations of comparative advantage*. Oxford University Press.

Hansson, B. (2008). Job-related training and benefits for individuals: A review of evidence and explanations, *OECD Education Working Papers No. 19*, OECD Publishing. https://doi.org/10.2139/ssrn.1347622

Hanushek, E. A., Schwerdt, G., Woessmann, L., & Wiederhold, S. (2013). Returns to skills around the world: Evidence from Piaac. *OECD Education Working Paper No. 101*, OECD Publishing. https://doi.org/10.3386/w19762

Huffman, M. L. (2004). Gender inequality across local wage hierarchies. *Work and Occupations, 31*(3), 323–344. https://doi.org/10.1177/0730888404266384

Jones, M. K., Jones, R. J., Latreille, P. L., & Sloane, P. J. (2008). Training, job satisfaction and workplace performance in Britain: Evidence from WERS 2004. *Labour, 23*, 139–175. https://doi.org/10.1111/j.1467-9914.2008.00434.x

Jones, D. C., Kalmi, P., & Kauhanen, A. (2011). The effects of general and firm-specific training on wages and performance: Evidence from banking. *Oxford Economic Papers, 64*(1), 151–175. https://doi.org/10.1093/oep/gpr013

Kauffman, K. (2015). Non-formal education in international comparison: Patterns of participation and investment in selected European countries. *International Journal for Research in Vocational Education and Training, 2*(4), 239–267. https://doi.org/10.13152/ijrvet.2.4.1

Kilpi-Jakonen, E., Vono de Vilhena, D., & Blossfeld, H. (2015). Adult learning and social inequalities: Processes of equalisation or cumulative disadvantage? *International Review of Education, 61*, 529–546. https://doi.org/10.1007/s11159-015-9498-5

Koenker, R., & Bassett, G. S. (1978). Regression quantiles. *Econometrica, 46*(1), 33–50. https://doi.org/10.2307/1913643

Luchinskaya, D., & Dickinson, P. (2019). "Virtuous" and "Vicious" circles? Adults' participation in different types of training in the UK and its association with wages. *Social Inclusion, 7*(3), 177–201. https://doi.org/10.17645/si.v7i3.2039

Magnusson, C. (2009). Gender, occupational prestige and wages: A test of devaluation theory. *European Sociological Review, 25*, 87–101. https://doi.org/10.1093/esr/jcn035

Magnusson, C. (2010). Why is there a gender wage gap according to occupational prestige? *Acta Sociologica, 53*(2), 99–117. https://doi.org/10.1177/0001699310365627

Mandel, H. (2010). Winners and losers: The consequences of welfare state policies for gender wage inequality. *European Sociological Review, 28*(2), 241–262. https://doi.org/10.1093/esr/jcq061

Mandel, H., & Semyonov, M. (2006). A welfare state paradox: State interventions and women's employment opportunities in 22 countries. *American Journal of Sociology, 111*(6), 1910–1949. https://doi.org/10.1086/499912

McMullin, P., & Kilpi-Jakonen, E. (2014). Cumulative (dis)advantage? Patterns of participation and outcomes of adult learning in Great Britain. In H.-P. Blossfeld, E. Kilpi-Jakonen, D. Vono de Vilhena & S. Buchholz (Eds.), *Adult Learning in Modern Societies: An international comparison from a life-course perspective* (pp. 119–139). Edward Elgar. https://doi.org/10.4337/9781783475186.00015

Minello, A., & Blossfeld, H. P. (2017). Can adult education compensate for early disadvantages? The role of adult education in reducing inequalities for German men and women. In J. Erola & E. Kilpi-Jakonen (Eds.), *Social inequality across the generations: The role of compensation and multiplication in resource accumulation* (pp. 161–180). Edward Elgar Publishing. https://doi.org/10.4337/9781786432568

Mühler, G., Beckmann, M., & Schauenberg, B. (2007). The returns to continuous training in Germany: New evidence from propensity score matching estimators. *Review of Managerial Science, 1*, 209–235. https://doi.org/10.1007/s11846-007-0014-6

Nicodemo, C. (2009). Gender pay gap and quantile regression in European families. *Iza Discussion Paper No. 3978*. http://ftp.iza.org/dp3978.pdf

Organisation for Economic Co-operation and Development. (1999). Training of adult workers in OECD countries: Measurement and analysis. Employment Outlook, Chapter 3, OECD, Paris.

Organisation for Economic Co-operation and Development. (2004). Improving skills for more and better jobs: Does training make a difference? Employment outlook, Chapter 4, OECD, Paris.

Organisation for Economic Co-operation and Development. (2013). Technical report of the survey of adult skills (PIAAC), OECD, Paris.

O'Halloran, P. L. (2008). Gender differences in formal on-the-job training: Incidence, duration, and intensity. *Labour, 22*(4), 629–659. https://doi.org/10.1111/j.1467-9914.2008.00427.x

Oliver, D. (2016). Wage determination in Australia: The impact of qualifications, awards and enterprise agreements. *Journal of Industrial Relations, 58*(1), 69–92. https://doi.org/10.1177/0022185615598188

Olsen, W., & Walby, S. (2004). Modelling gender pay gaps. *Equal Opportunities Commission Working Paper Series no. 17*. https://www.escholar.manchester.ac.uk/api/datastream?publicationPid=uk-ac-man-scw:75228&datastreamId=FULL-TEXT.PDF

Perales, F. (2013). Occupational sex-segregation, specialized human capital and wages: Evidence from Britain. *Work Employment & Society, 27*(4), 600–620. https://doi.org/10.1177/0950017012460305

Pischke, J. S. (2001). Continuous training in Germany. *Journal of Population Economics, 14*, 523–548. https://doi.org/10.1007/s001480000040

Schøne, P. (2004). Firm-financed training: Firm specific or general skills? *Empirical Economics, 29*, 885–900. https://doi.org/10.1007/s00181-004-0219-3

Schneider, S. L. (2018) Education in OECD's PIAAC Study: How well do different harmonized measures predict skills? *Methods, Data, Analysis, 12*(1), 151–176. https://doi.org/10.12758/mda.2017.15

Simpson, P. A., & Stroh, L. K. (2002). Revisiting gender variation in training. *Feminist Economics, 8*(3), 21–53. https://doi.org/10.1080/0003684022000026656

Spence, A. M. (1973). Job market signalling. *Quarterly Journal of Economics, 87*, 355–74. https://doi.org/10.2307/1882010

Struthers, K., & Strachan, G. (2019). Attracting women into male-dominated trades: Views of young women in Australia. I*nternational Journal for Research in Vocational Education and Training, 6*(1), 1–19. https://doi.org/10.13152/ijrvet.6.1.1

Triventi, M., & Barone, C. (2014). Returns to adult learning in comparative perspective. In H.-P. Blossfeld, E. Kilpi-Jakonen, D. V. de Vilbena & S. Buchholz (Eds.), *Adult learning in modern societies: An international comparison from a life-course perspective* (pp. 56–75). Edward Elgar. https://doi.org/10.4337/9781783475186.00011

Watts, M. J. (2003). The evolution of occupational gender segregation in Australia: Measurement and interpretation. *Australian Journal of Labour Economics, 6*, 631–655. https://EconPapers.repec.org/RePEc:ozl:journl:v:6:y:2003:i:4:p:631-655

Weeden, K. A., & Sørensen, J. B. (2004). A framework for analyzing industrial and occupational sex segregation in the U.S.. Standford University Press.

Wozny, C., & Schneider, M. R. (2014). A matter of degree: The continuing training gap for women in Europe. *Socio-Economic Review, 12*(2), 353–379. https://doi.org/10.1093/ser/mwu008

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Varieties Within a Collective Skill Formation System: How VET Governance in Switzerland is Shaped by Associations

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Abstract

Context: International scholarship and policy tend to depict national structures governing Vocational Education and Training (VET) as uniform and devoid of internal differences. This macro perspective neglects the numerous processes at the meso and micro level that shape the structure and content of VET. This article focusses on professional associations (meso level) in Switzerland to examine the heterogeneity of governance of individual VET programmes that can exist within one country or one collective skill formation system.

Approach: Drawing on insights from historical institutionalism and research on corporatism, we argue that these differences are the product of the characteristics, traditional practices and styles of reasoning of the various associations involved in VET governance. Our analysis is based on expert interviews and governance documents in two vocational areas: Electrotechnology and food services.

Findings: We identify and decode an array of cooperative practices and show that collective skill formation has a different meaning for different associations and, correspondingly, different occupations. Collaboration with state actors, unions, VET schools and single firms, as well as voting procedures, differ considerably between associations. Furthermore, we find that these different modes of governance are determined by associational characteristics such as size, level of professionalization, location and established cooperative practices, as well as traditional styles of reasonings.

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Conclusion: The findings indicate that the decisions taken are not always the product of current day training requirements but of historically grown associational characteristics. Thus, path dependencies are to be considered not only at a macro level but also at the meso level. There is a multifaceted variety of governance approaches beneath the classification "collective skill formation system". Associations are key in defining VET content, working life structures and collectivity.

Keywords: VET, Vocational Education and Training, Governance, Collective Skill Formation, Historical Institutionalism, Corporatism, Styles of Reasoning in VET

1 Introduction

Over the past few decades, Vocational Education and Training (VET) has been assigned a key role in coping with the challenges of globalization, digitalization and other sweeping transformations of the 21st century. A recent Organization for Economic Cooperation and Development (OECD) review of different VET systems found that "after a period of relative neglect in many countries, apprenticeship and other forms of work-based learning are experiencing a revival" (OECD, 2018, p. 11). In this context, Switzerland has increasingly become a role model, because it has a longstanding tradition of classroom instruction and on-the-job training (the "dual system") that relies on a specific form of governance, labelled collective skill formation (Busemeyer & Trampusch, 2012; Krummenacher, 2018).

Approaches that seek to transfer the Swiss model to other countries tend to neglect or underestimate the heterogenous character of "duality", particularly the plurality of coordinating actors and multifaceted forms of cooperation and governance. Whereas differences regarding dual organizations are well-known and researched (Wettstein & Gonon, 2009), there is a dearth of knowledge about different modes of governance. Scholars have advocated further study of decentralized cooperation in vocational education, proposing that "…since actual cooperation can rarely be imposed by law but happens on the ground, it is likely to vary along regional, sectoral and occupational lines…" (Emmenegger et al., 2018, p. 5).

The particular characteristics of Swiss VET governance have been studied extensively and compared to other countries (Rauner & Wittig, 2009). For instance, political scientists have categorized Switzerland's VET as a prime example of collective skill formation (Busemeyer & Trampusch, 2012; Gonon & Maurer, 2012), decentralized cooperation (Emmenegger et al., 2018), plural governance (Rauner & Wittig, 2009, p. 45) and public-private partnership. While this focus on the national (macro) level dominates research, intermediary associations (meso level) and single firms (micro level) have rarely been addressed, even though they are crucial parts of collective governance.

This article sheds light on the different practices behind those classifications at the macro level by focussing on the meso level of governance, namely the professional associations. The following questions guide the analysis: What are the associational characteristics of cooperation practices? What are the reasons for the various approaches? The article thus explores not only the *how* of governance, but also the *why*; a crucial question that is neglected in many studies (Benz et al., 2007, pp. 19–20; Rosenmund, 2019). Drawing on insights from historical institutionalism and literature on corporatism, we will argue that the variety of governance approaches is not only shaped by "rational" deliberations and requirements endorsed by each occupation's respective industry, but also by the path dependent characteristics, modes of cooperation and styles of reasoning of each occupation's responsible professional association.

To identify the different cooperative practices and decipher the driving logic, this study focusses on the Swiss Commissions for Professional Development and Quality (Schweizerische Kommissionen für Berufsentwicklung und Qualität—hereafter referred to as "Commissions" or "Commissions B&Q"). These Commissions were created for every occupational field following the VET Act of 2002, to oversee the content and quality of vocational training. They generally consist of stakeholders from the state (cantonal and federal government authorities) and professional associations, but as the legislation does not stipulate clear criteria for membership, professional associations from each occupation fill the Commissions and determine their tasks. The Commissions—described as the "heart of collective governance [Verbundpartnerschaft]" (Fleischmann, 2012)—are the optimal object of investigation since they represent a neuralgic point for governance at the meso level that is directed by professional associations.

In this paper we provide insight into different modes of cooperation and the logic that shapes them. Our analysis focusses on two occupational fields: Food services and electrotechnology. We conducted eleven in-depth expert interviews with chairmen and chairwomen of every Commission B&Q in the two fields. We supplemented the interview data with information gathered from a variety of other sources, such as national and occupational regulations, and annual reports from professional associations. By decoding and disentangling the cooperative processes, we contribute to a more nuanced picture of VET governance in Switzerland, and thus one case of collective skill formation in particular.

In the first section, we provide an overview of the theories that inform our study and show how our work relates to previous studies. Second, we describe our case selection strategy and methodology. We then focus on empirical data by examining the variety of cooperative practices and disentangling the different underlying associational characteristics and styles of reasoning. We conclude by emphasizing that associations are key not only by defining VET content, but collectivity and working life structures.

2 Governance Regimes in VET

This article draws upon insights from historical institutionalism, research on corporatism and associations in VET. Studies in historical institutionalism have shown that existing practices develop stable developmental trajectories along path dependencies, which guarantee a continuity of established structures and processes (Beyer, 2015; Mahoney, 2000). Once put into motion, developments gather strength, reinforce existing pathways, make breaks and radical transformation unlikely and encourage incremental change to meet new requirements or demands (Pierson, 2000). Thelen (2004) and Busemeyer and Trampusch (2012) applied the approach of historical institutionalism to vocational education. Thelen argued that industrialized states and their vocational education systems are not converging globally. She stressed that differences will remain because of "national production regimes" and observed that the answer to the question of "why institutions take the form they do" is historical not functional (Thelen, 2004, pp. 1, 26). Drawing on the work of Thelen, Busemeyer and Trampusch noted:

> The establishment of a collective institutional framework is not the result of a rationalistic process of deliberation among firms searching for the optimal skill formation strategy. Instead, training institutions have deep roots in the history of politics and society, which in the case of apprenticeships, often go back to the Middle Ages. (Busemeyer & Trampusch, 2012, p. 7)

VET systems cannot be seen only as need-oriented variables of companies. Rather, they must ultimately be understood against the backdrop of a political culture that expresses itself in "routines of processing and solving society's problems of organization" (Rosenmund, 2019), or in a "production or work order of a country" (Trampusch, 2014, p. 165).

It is exactly this aspect that is emphasized by the "varieties of capitalism" approach. "Many actors learn to follow a set of informal rules by virtue of experience with a familiar set of actors and the shared understandings that accumulate from this experience constitute something like a common culture" (Hall & Soskice, 2001, p. 13). In the Swiss case, this common culture corresponds to a "coordinated market economy" rather than a "liberal market economy" (Hall & Soskice, 2001, p. 13). The former is distinguished by the fact that it designs its qualification systems in a process of "collective skill formation" and thus expresses itself through high levels of regulation and involvement of private companies. These constellations tend to bring about dual VET models, as found in Switzerland, Germany, Austria and Denmark (Busemeyer & Trampusch, 2012). Comparative studies that rely on the "varieties of capitalism" approach explain national characteristics of VET governance systems by way of their respective political systems (Mayer & Solga, 2008; Bosch & Charest, 2008). These studies have been criticized for the fact that they tell us little about national particularities and

the internal national differences between countries with the same political system (Goergen et al., 2012; Gonon, 2016).

These national varieties would become visible by shedding light on decentralized VET cooperation. Current knowledge about cooperation processes "on the ground" is limited, even though it is a core element of collective skill formation systems (Emmenegger et al., 2018). Research on corporatism can provide first indications of the idiosyncrasies of decentral cooperation. A corporatist governance is distinguished by the cooperation of state and labour market stakeholders, represented in intermediary associations such as professional organizations, as is usual in systems of collective skill formation (Culpepper & Thelen, 2008). Studies on corporatism have shown that different work relationships and forms of social partnership can be traced back not only to the degree of inclusion of social partners and the degree of state control, but also to factors regarding companies, occupation and branch membership (Culpepper, 2003, 2007; Meyrat, 2000; Trampusch, 2014). Associations have to negotiate compromises between collective and company-specific interests (Behrens, 2017). Swiss associations responsible for VET tend to (up to 97%) represent the employer's interest (Emmenegger et al., 2019) whereas unions—due to a path dependent development of Swiss VET—are hardly represented in VET governance compared to those in Germany. Furthermore, studies have shown that associations act in their own right (Strebel et al., 2019a; Seitzl & Emmenegger, 2019) and tend to unfold their own logic to maintain the status quo (Hotz-Hart, 2008, p. 115). "The logics of occupations [and thus professional associations that are responsible for them] build on reproduction and further development of existing structures and programmes. Associations are thus less focussed on young people's individual educational requirements and on research and innovation, but oriented towards a timely adapted reproduction of the occupational offspring" (Bauder, 2008, p. 42).

This research on associations leads to two assumptions. First, we propose that the characteristics of associations influence their governance approaches in VET; second, drawing upon historical institutionalism, we argue that over time, they developed specific cooperation practices and styles of reasoning that significantly shape their decisions. In other words, we expect to find path dependencies (as hinted by Bauder's logic of reproduction) at the meso level of governance, much as at the macro level (as outlined by research based on historical institutionalism). It is assumed that associations are like nation states, bound to their institutional legacy and, in a nutshell, not only functionally but historically informed.

3 Case Selection Strategy and Methodology

In order to explore the associational characteristics of cooperation and to shed light on the reasons or reasonings behind these various approaches, this study analyses Commissions

B&Q, their compositions and their ways of working. In the following, we contextualize these Commissions within Swiss VET governance and highlight their significance.

The collective governance of Swiss VET is generally based on three institutional principles: Federalism, corporatism and consensus democracy. The last principle does not correspond to any formal constitutional rules, but to a practice developed over time that primarily aims to involve a large number of individuals in consensus decision-making (Berner, 2013, pp. 40–42). The corporatist structure of Swiss vocational training is characterized by a decentralized organization and cooperation of state and labour market actors (Oesch, 2011; Degen, 2012). Thus, responsibilities are shared between associations and the state (cantons and federal government). It is notable that the involvement of the associations does not occur compulsorily in chambers, as in Germany, but takes place voluntarily (Armingeon, 1997). The cooperation between the associations and the state, and between the associations themselves, is based on a legal framework that leaves a great degree of freedom and scope for negotiation. This can result in partial conflict prevention (Gonon & Zehnder, 2016, pp. 49–50) and makes cooperation dependent on a "shared logic of actions" (Emmenegger et al., 2018).

Swiss VET is therefore operationalized at three levels: The federal VET office (responsible for general governance), the canton departments for economy and education (responsible for implementation) and the employees' and employers' (professional) associations (responsible for the content and specifics of occupational training). Presently, there are 146 associations responsible for the 230 occupations in Switzerland. Four different types can be distinguished: company, professional, employee associations and specialized educational organizations (Strebel et al., 2019b). Usually, one association is responsible for one occupation or occupational field. This means that they develop education plans and regulations for their respective occupations and submit these to the federal office for approval.

In the wake of the VET Act 2002 and encouraged by the federal authorities, the associations started to establish Commissions B&Q. At the formal level, there are no unambiguous overarching regulations for the Commissions, as they are not explicitly mentioned in the VET Act (BBG 2002, Art. 8; Berner, 2013; Meyer, 2007). Although the law places responsibility for quality assurance with the providers of vocational training (and hence with the associations), it does not stipulate how they must fulfil this duty. The subordinate Vocational Training Directive (BBV 2003, Art. 12) is more specific, but it too affords the associations a great deal of freedom. It imposes no conditions on how the associations determine the tasks of the Commissions and only two conditions on how they determine Commission membership: (i) In addition to representatives from the respective associations, the committee must contain at least one representative from the federal authority and (ii) must adequately represent Switzerland's language regions.

The lack of concrete legal requirements led to the creation of an informal regulatory process, which in turn gave rise to written guidelines for the Commissions. The guidelines, deve-

loped collaboratively by federal authorities, cantons and one of the umbrella associations, recommend that the Commissions periodically review VET curricula and quality, and update them to meet changing professional demands (SGV et al., 2014, p. 3). This duty positions the Commissions as very important actors in decentralized VET governance, especially with regard to the respective occupation's regulation and curricula. The guidelines also suggest that alongside the membership stipulated by the Vocational Training Directive, the Commissions also contain representatives from the cantons and teaching staff (vocational schools) (SGV et al., 2014, p. 6).

The professional associations are therefore largely free in determining the membership and tasks of the Commissions B&Q. The composition and tasks of the board are formally fixed in the *Bildungsverordnungen* (regulation for each occupation). The fact that all VET stakeholders come together in these Commissions, yet the respective associations are (almost) free to choose the representatives and define the tasks, makes the Commissions B&Q crystallization points of collective governance at the meso level. This means that they are optimal objects of study to explore how associations cooperate and why they act like they do.

Our analysis focusses on the Commissions B&Q of two occupational fields: Food services and electrotechnology.[1] Research on corporatism has shown that branch membership can influence associations' characteristics of cooperation. These two representative occupational fields have been chosen because they are different fields but have similarities with regard to composition. This approach allows us to identify and decipher typical patterns of cooperation for the respective branches. Both fields cover a wide variety of companies, from the technologically advanced and internationally orientated to smaller, more traditional locally based firms (Roth, 2007; Keller & Kurzen, 2012). In addition, the occupations they represent are quite heterogeneous with regard to the required skills and the number of trainees[2] (Stalder, 2011) and both are facing challenges—albeit for different reasons—in recruiting adequate numbers of apprentices (cf. Berner, 2018; Staatssekretariat für Wirtschaft, 2016, p. 41).

In the field of nutrition there are six associations and in the field of electrotechnology there are five associations that are accountable for the respective occupations, compositions and tasks of the Commissions B&Q. They all belong to the category of professional associations, but differ with regard to size and professionalization: Some have up to 21 full time employees, while others are staffed on an entirely part time basis.[3]

1 See Schweizerisches Dienstleistungszentrum Berufsbildung/Berufs-, Studien und Laufbahnberatung [SDBB] (2018). Food services includes occupations in the fields of nutrition and food technology. Electrotechnology includes occupations from the fields of electrical installation and electronics.

2 In total there are six occupations in nutrition (n) and 10 in electrotechnology (e). In 2016, four (1n + 3e) had more than 600 apprentices, seven (2n + 5e) had 100 to 600 and five had fewer than 100 (3n + 2e) (SBFI, 2020).

3 The field of nutrition consists of two big (Schweizerischer Bäcker-Confiseurmeister-Verband, OdA AgriAliForm), two medium-sized (Schweizerischer Fleischfachverband; Milchwirtschaftlicher Verein) and two small associations (Schweizerischer Verein Arbeitswelt Müller/in; Arbeitsgemeinschaft Lebensmitteltechnologen/in). The field of electrotechnology consists of two big (Verband der Maschinen-Elektro- und Metallindustrie, EIT.swiss), two medium-sized (Verband Schweizerischer Elektrizitätsunternehmen; MultimediaTec Swiss) and one small association (Arbeitsgemeinschaft der Lehrmeister von Physiklaboranten).

Data collection comprised 11 expert interviews conducted with the chairwomen (n = 1) and chairmen (n = 10) of the Commissions B&Q whose members are recruited by the responsible associations.[4] Interview data were complemented with documents, such as the regulations of the different occupations (Bildungsverordnungen), where membership and tasks of the Commissions B&Q are formally described, as well as annual reports from the professional associations. The interviews were semi-structured, consisting of open questions (focussing on the characteristics of cooperative practices) and problem-oriented sequences (focussing on the underlying reasonings) (Kruse, 2015; Helfferich, 2011). The interviews were fully transcribed and coded. For the first research question, concerning the associational characteristics of cooperation practices, the coding focussed on three key elements of cooperation: Membership (who, how many?), recruiting and voting procedures, and ways of working. These categories were derived from studies on corporatism, which have shown that these aspects influence cooperation practices significantly (Culpepper, 2003, 2007; Meyrat, 2000; Trampusch, 2014).

For the second question, concerning the reasons for the different practices, the categories were inductively generated by reconstructing the logic behind the association's diverse actions (Meuser & Nagel, 2009, 2010; Bogner et al., 2014; Bogner & Menz, 2009). Thus, in contrast to the most popular approach of process tracing within historical institutionalism, we tried to identify and decipher path dependencies via the reasonings or elaborations on decisions put forward by the experts we interviewed. By doing so, we were able to extract the following intertwined factors that explain the diversity of the Commissions: Age, size, level of professionalization, location, financial strength, membership, established cooperative practices and styles of reasoning.

4 Varieties of Cooperative Practices

In the following, we briefly outline the formal and informal profiles and practices of the Commissions B&Q, i.e., how they govern. The characteristics or heterogeneity of associational governance is demonstrated by showing differences regarding board members, recruiting and voting procedures, and ways of working.

All Commissions B&Q adhere to formal and informal guidelines regarding tasks and membership, but this merely represents the lowest common denominator among the different associations. Differences are clearly evident between the different associations rather than different occupational fields, since no governance pattern is evident within one of the fields. For instance, some Commissions are allowed to operate detached from their professional associations. These Commissions may submit proposals for VET changes directly to the

4 Interviews lasted 60-90 minutes. They took place between March and December 2018, on the premises of the associations or companies; one was conducted at the University of Zurich.

national authorities, while the majority of Commissions must first submit their ideas to the associations. The membership of the Commissions can also vary greatly despite all having representatives from the federal authorities, cantons, professional associations and teaching staff. For example, the number of members ranges from seven to 19 people. This is not only due to the size of the professions but also to differences in recruiting practices between the associations. Some Commissions have representatives from multiple associations whose companies carry out VET; others have representatives from individual companies engaged in VET and from companies that do not perform VET.

The number of school and canton representatives in the Commissions is similarly diverse. Some Commissions, especially for smaller professions, have representatives from all the vocational schools. Many Commissions have two canton representatives (instead of the recommended one), as this may allow them to cover different language regions. In order to better represent Switzerland's two larger language regions (French and German), some associations base important functions (such as president and secretary) in different locations.

Another area of difference is trade union representation. While trade unions tend to play a marginal role in Swiss VET—particularly compared to Germany (Emmenegger et al., 2018, p. 18)—this varies among the Commissions we examined. For some professions, worker or union representatives take up to four spots on the Commissions; others lack a single employee representative.

Recruitment approaches are generally similar across all associations, as the general assemblies of the professional associations elect their representatives for the Commissions. In many cases, these elections confirm the nominated candidates. This is because the post of representative takes time and effort, and takes post-holders away from their day job. One interviewee said "the [election] is always close to 100 per cent. And if it is not 100 per cent, then this is because one person fell asleep (laughter) or person was too lazy to raise his hand. So, it's more about...signing off [on the nominees]" (Interview C).

However, there are major differences in voting rights. In some Commissions, all participants get one vote, but in others, the representatives of the federal authorities, cantons and associations each have one vote, which forces consensus. School representatives tend to be excluded from voting. In some cases, for specific topics such as funding, only industry representatives are allowed to vote.

Despite their differences in membership and forms of cooperation, the Commissions share the same culture of cooperation across interest groups. Interviewees reported that the Commissions rarely hold votes; though different interests exist, the members place much value on finding a consensus. Most interviewees connected this approach to the consensus democracy that defines Switzerland's political culture. Metaphors such as "getting everyone on board" and "broad support" were common in the interviews. The Commissions wanted to avoid conflicts or the rejection of reforms because "we know each other in the branch, and

thus we have to rely on being able to talk to each other. Creating fronts is useless" (Interview E). One interviewee referred to the people involved in the VET of one small profession as a family (Interview G).

Company and association representatives regard the growing body of federal regulations as inflexible, rigid and unreliable. Interviewees said the regulations allow little room for negotiation. In the past, the pressure mostly came internally, from companies. Now the pressure is more external, especially with regard to the time frame for revising VET, as the Commissions are required to review the VET of their respective profession every five years. The interviewees also criticized the recent requirement to base contents on competence models. These professionalization trends were felt to present challenges to smaller and part time associations. One interviewee pointedly complained: "So [they] motivate me to go up a mountain, backpack full, heavy. And after I've barely arrived at the top, [they say], well done...but look now, over there [is] the next mountain" (Interview G). These changes were felt to be less controversial among associations whose companies possess professional training structures, i.e., full time VET employees with dedicated time and expertise, because these companies can shoulder the work for the associations and thus have more influence and room to manoeuvre.

5 Reasons for Different Governance Approaches

Since there are no patterns of governance discernible within one of the occupational fields, the cooperation practices of the Commissions B&Q are not determined by the occupational field. The various modes of governance arise from the different characteristics of the responsible associations (age, size, professionalization, location, financial strength and membership) and the cooperation practices and specific styles of reasoning developed over time. Decisions are therefore not only made on a functional basis, but are historically informed to a considerable degree. In the following, we shed light on these determining characteristics, practices of cooperation and styles of reasoning.

Age, Size and Level of Professionalization

The Commissions B&Q tend to have more flexibility in governance if the association that is responsible for an occupation was newly founded. This is because there are no historical paths to determine a Commission's tasks and practices.

Larger associations tend to see more politicized Commission elections. While smaller associations complain that they have to "knock on doors" (Interview H) to recruit members so that elections are usually decided unanimously, an interviewee from a major association referred to his election as president of the Commission as a "fight" that ultimately turned

on a dispute between the cantons rather than on the actual qualifications of the candidates (Interview D).

Other associations explicitly choose to remain small to avoid politicized elections, although they could easily join larger associations. One interviewee reflected on the nature of being a small association:

> The advantage of being small is of course, I mean...as I said, I can pick up the phone and maybe call...let's say 10 people. And then we can decide whether to do something what we do...of course, being so flexible is an advantage. The downside is...this office does a lot... let's say 80% (laughter) probably comes out of this office. (Interview C)

This interviewee's company possesses professionalized training structures for generating these capacities, which is another example of how different the influence of single firms can be. Professionalization plays an important role; some associations have full time personnel, while others work with a small staff on a part time basis. Generally, the greater an association's professionalization, the more its agenda is predefined and the more it is developed by its office staff. Furthermore, associations with highly professional structures are increasingly involved in drafting and developing national models and strategies, giving them greater influence at the national level.

Location, Financial Strength and Membership

Both the increasing professional requirements and the geographical location of associations and companies can encourage an accumulation of roles or positions within committees. Companies located in central Switzerland or near associations are more likely to participate. One interviewee reflected:

> I find that [the participation of western Switzerland is] a bit difficult because...the sessions always take place in Zurich, because that just makes sense. Because most of them come from Zurich anyway. That means that they [the western Swiss] always have a long way to travel. And hence they do not come very often...I find this this very problematic. (Interview C)

Likewise, an interviewee from another association in Bern emphasized that people would be more involved if they were "around an hour outside of Bern and not just from Upper Valais and from the Graubünden...But we try to do as good a job as we can" (Interview F).

The financial strength and infrastructural factors of the associations also play a central role in cooperative practices. For example, associations tend to cooperate with others if their professions are affiliated with the same vocational school, where they benefit from infrastructural "synergies" (Interview I) that are not exclusively professional. There are also associations that work with others to create new professions to achieve a critical mass for key financing

issues, especially high attendance in school classrooms. Infrastructural factors can also determine whether associations seek collaboration with others or seek to govern their profession independently. For example, an association whose profession experienced a substantial decline in the number of trainees and which had not previously engaged in networking decided to work with other associations and create a new profession. Instead of settling for a smaller number of trainees, it is now looking to cooperate with other associations in order to maintain the size of its association and, in particular, to continue to fund its training centre.

The specific membership or characteristics of the companies represented by the association influences recruitment and cooperation practices of the Commissions. For example, it is desirable for associations to create VET programmes that are as attractive as possible for companies; the goal is to maximize the number of companies able to train the profession with as much freedom as possible. One strategy is to formulate open VET regulations and curricula. One interviewee described his association as:

> More of an...association that brings together all those who cannot be trained in a large profession...those who do not fit in come to us. And then we try to make the best of it. Even if the situations can be very different. Even company size or products. [This is why] our VET regulations and curricula are very, how should I put it? Not vague...[so let's say] non-specific. And afterwards, companies have to implement all this or translate it all for themselves. (Interview A)

Existing market hegemonies are also reflected in the Commissions B&Q. For example, dominant companies usually have the financial resources to participate in several committees, which affords them greater influence. As one interviewee told us:

> So in this [association] of course, [name of firm] plays a big role because we have the majority. So…we have the largest...market share in Switzerland. This means that we have a lot to say in all the committees because we pay more at the association level. (Interview A)

Another interviewee told us "those who pay more should say more and those who pay less... should also have their say, but they simply have fewer votes" (Interview B). In particular, more resource-rich firms can afford professionalized structures for training and employ dedicated personnel for VET, which improves their ability to get involved in VET or relevant committees.

Established Cooperative Practices and Styles of Reasoning

The established cooperative practices have an impact on the presence of employee and trade union representatives. For example, professional associations traditionally working with worker associations and trade unions typically include employee representatives in their respective Commission. Here too, however, one interviewee drew a distinction between industry

and manual trades: "People in manual trades of course are not thrilled by...such things...and the industry has grown accustomed to the unions...and is not scared by them" (Interview F). The close relationship between cooperative practices and specific styles of reasoning is also shaped by a sense of belonging to specific industries: "I have noticed that every industry, and of course we are no different, primarily wants to tends to its own garden" and although cooperation does occur, no one thinks "out of the box". Rather, the cooperation that does take place has "a lot of structures behind it, history behind it, personalities behind it" (Interview F). What is striking—with implications for future reforms—is that associations are more likely to collaborate with others or to create joint occupations if they are in the same industry, even though they might have more in common with professions in another industries. Several interviewees said that older associations tend to be conservative: "I'm not saying that they are dusty, but when it comes to bigger topics, they tend to do as they have always done" (Interview D). Interestingly, one interviewee attributed this desire for continuity to the specific professional work, which consists of assembling elements designed to last for decades. In other words, he believed that occupational activities have an effect on the thinking of the companies and ultimately of the associations.

6 Conclusion: Associations Defining Collectivity and Working Life

Our focus on governance at the meso level has allowed us to unpack the concept of collective skill formation in Switzerland, which has various facets and meaning for different associations and occupations. Legislation from 2002 incorporated standardized elements into the governance architecture of Swiss VET, such as the quality assurance Commissions B&Q established for every occupation. However, our analysis has shown that the specifics associated with these structures—membership and cooperative practices—can differ significantly between associations and therefore between occupations. This heterogeneity allows the associations to respond to their own specific needs and those of their members. However, our analysis has also shown that some of the decisions are not directly attributable to VET or functional negotiations, but rather, to the characteristics, specific cooperative practices and styles of reasoning that the associations have developed over time. These findings are underpinned by the fact that no patterns of governance were found within one of the occupational fields.

Overall, the findings indicate that the negotiations on the ground or, at meso level, are key for VET governance in Switzerland. Associations not only shape the content of individual VET programs—as their role is described from the macro perspective—but they define the structure of working life and collectivity. The latter becomes visible in the different recruiting and voting practices within the Commissions B&Q. A board where one or four representatives from the vocational school(s) are integrated will most likely develop or define different

priorities. Furthermore, the fact that in some Commissions B&Q the school delegates do not have a voting right will affect the decisions that are taken. The same applies with regard to the integration of union representatives. Emmenegger et al. (2019) showed that the inclusion of unions significantly impacts the time students spend at school. In a context of continuous upskilling, the distribution between the time spent in the workplace and at school is crucial (SBFI, 2017). Emmenegger et al. also distinguished between liberal (less union integration, like Switzerland) and social (constant union integration, like Germany) collective skill formation systems. However, our examination of the meso level reveals that it is difficult to make this distinction clearly, as some occupations in Switzerland demonstrate a high participation of union delegates.

In addition to the actual representatives in the Commissions B&Q, the associations or their characteristics define collectivity or collective governance. This happens by the generation of different degrees of influence, either at the level of firms or associations. Despite the constant emphasis on consensus democracy among interviewees (in some cases, even using the metaphor of a family), there is an important role played by accumulated influence, which points to hegemonic structures. For example, associations and companies with larger budgets have more influence and a greater ability to shape VET than financially weaker organizations. This is because big budgets allow for professionalized structures and full time staff instead of part time volunteers. As the pressure to professionalize increases, e.g., through shorter review periods and competence-based curricula, these tendencies are likely to become more pronounced.

Furthermore, our findings indicate that associations not only shape individual professions but also the VET landscape and the general structure of working life. This is seen when they prevent or encourage the merger of different occupations to become a larger occupational field. Furthermore, the specific forms of thinking that inform associations within an industry, such as maintaining established infrastructures or carrying out traditional cooperative practices, may override "rational" objectives such as the similarity of training curricula.

Generally, the interviews stressed that many influencing factors are historically informed. They described a persistent inertia, not only in "material" structures but also in ideas. Associations and companies tend to rely on an established matrix of ideas that resists new visions and reforms. Our study focussed exclusively on two occupational fields, but it is reasonable to assume that these findings are transferrable to other occupational fields, although some associations may introduce new forms of governance depending on their characteristics. Once a certain path has been taken, domino effects— known in the literature on path dependencies as "increasing returns" (Beyer, 2005)—can occur. These can increase the importance of individual companies and, in the long term, can establish new power structures. The effects of a path are therefore not only evident at the national level, but also at the meso level, in the governance regimes and paradigms of associations. It may prove challenging for VET gover-

nance in collective skill formation systems to overcome well-established cooperation practices and styles of reasoning, move beyond unnecessary restrictions and think "out of the box".

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References

Armingeon, K. (1997). Swiss corporatism in comparative perspective. *West European Politics, 20*(4), 164–179. https://doi.org/10.1080/01402389708425223

Bauder, T. (2008). Der Entwicklungsprozess des ersten eidgenössischen Berufsbildungsgesetzes. Unterschiedliche Interessen, gemeinsames Ziel [The development process of the first federal vocational law. Different interests, common goal]. In T. Bauder & F. Osterwalder (Eds.), *75 Jahre eidgenössisches Berufsbildungsgesetz: Politische, pädagogische, ökonomische Perspektiven* (pp. 11–50). hep.

Behrens, M. (2017). Structure and competing logics: The art of shaping interests within German employers' associations. *Socio-Economic Review, 16*(4), 769–789. https://doi.org/10.1093/ser/mwx037

Benz, A., Lütz, S., Schimank, U., & Simonis, G. (2007). Einleitung [Introduction]. In A. Benz, S. Lütz, U. Schimank & G. Simonis (Eds.), *Handbuch Governance: Theoretische Grundlagen und empirische Anwendungsfelder* [Handbook governance: Theoretical foundations and empirical implementation fields] (pp. 9–25). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-90407-8

Berner, T. (2018). *"Unbeliebte" Lehrberufe: Image-Offensiven von Branchenverbänden zahlen sich aus* ["Unpopular" occupations: Associational image strategies pay off]. Das Magazin für KMU. https://www.organisator.ch/unbeliebte-lehrberufe-image-offensiven-von-branchenverbaenden-zahlen-sich-aus/

Berner, E. (2013). "Verbundpartnerschaft" – Schlagwort oder Erfolgsrezept? Zur Steuerung der schweizerischen Berufsbildung ["Collective governance" – slogan or recipe for success? About Swiss VET governance]. In M. Maurer & P. Gonon (Eds.), *Herausforderungen für die Berufsbildung in der Schweiz* [Challenges for Swiss VET] (pp. 37–60). hep.

Beyer, J. (2005). Pfadabhängigkeit ist nicht gleich Pfadabhängigkeit! Wider den impliziten Konservatismus eines gängigen Konzepts [Not all path dependence is alike – a critique of the "implicit conservatism" of a common concept]. *Zeitschrift für Soziologie, 34*(1), 5–21. https://doi.org/10.1515/zfsoz-2005-0101

Beyer, J. (2015). Pfadabhängigkeit [Path dependency]. In G. Wenzelburger & R. Zohlnhöfer (Eds.), *Handbuch Policy-Forschung* (pp. 140–171). VS Verlag für Sozialwissenschaften. https://doi.org/10.1515/zfsoz-2005-0101

Bogner, A., Littig, B., & Menz, W. (2014). *Interviews mit Experten: Eine praxisorientierte Einführung* [Interviews with experts. A practice-oriented introduction]. Springer VS.

Bogner, A., & Menz, W. (2009). Das theoriegenerierende Experteninterview. Erkenntnisinteresse, Wissensformen, Interaktion [The theory generating expert interview. Research interest, forms of knowlege, interaction]. In A. Bogner, B. Littig & W. Menz (Eds.), *Experteninterviews: Theorien, Methoden, Anwendungsfelder* (3rd ed., pp. 61–98) . VS Verlag für Sozialwissenschaften.

Bosch, G., & Charest, J. (2008). Vocational training and the labour market in liberal and co-ordinated economies. *Industrial Relations Journal,* 39(5), 428–447. https://doi.org/10.1111/j.1468-2338.2008.00497.x

Busemeyer, M.-R., & Trampusch, C. (2012). *The political economy of skill formation*. Oxford University Press.

Culpepper, P., & Thelen, K. (2008). Institutions and collective actors in the provision of training: Historical and cross-national comparisons. In K. U. Mayer & H. Solga (Eds.), *Skill Formation: Interdisciplinary and Cross-National Perspectives* (pp. 21–49). Cambridge University Press. https://doi.org/10.1017/CBO9780511499593

Culpepper, P. (2003). *Creating cooperation: How states develop human capital in Europe*. Cornell University Press.

Culpepper, P. (2007). Small states and skill specificity: Austria, Switzerland, and interemployer cleavages in coordinated capitalism. *Comparative Political Studies, 40*(6), 611–637. https://doi.org/10.1177/0010414006295927

Degen, B. (2012). Arbeit und Kapital [Work and capital]. In P. Halbeisen, M. Müller & B. Veyrassat (Eds.), *Wirtschaftsgeschichte der Schweiz im 20. Jahrhundert* (pp. 873–922). Schwabe.

Emmenegger, P., Graf, L., & Strebel, A. (2019). Social versus liberal collective skill formation systems? A comparative-historical analysis of the role of trade unions in German and Swiss VET. *European Journal of Industrial Relations, 26*(3), 263–278. https://doi.org/10.1177/0959680119844426

Emmenegger, P., Graf, L., & Trampusch, C. (2018). The governance of decentralised cooperation in collective training systems: A review and conceptualization. *Journal of Vocational Education & Training, 71*(1), 2 –45. https://doi.org/10.1080/13636820.2018.1498906

Fleischmann, D. (2012). Gelebte Verbundpartnerschaft [Lived collective governance]. *Folio 2*, 22–35. https://danielfleischmann.ch/dokumente/folio_texte/1202_Gelebte_Verbundpartnerschaft.pdf

Goergen, M., Brewster, C., Wood, G., & Wilkinson, A. J. (2012). Varieties of capitalism and investments in human capital. Industrial Relations: *A Journal of Economy and Society, 51*(1), 501–527. https://doi.org/10.1111/j.1468-232X.2012.00688.x

Gonon, P., & Maurer, M. (2012). Education policy actors as stakeholders in the development of the collective skill system: The case of Switzerland. In M. R. Busemeyer & C. Trampusch (Eds.), *The Political Economy of Collective Skill Formation* (pp. 126–149). Oxford University Press.

Gonon, P., & Zehnder, L. (2016). Die Berufsbildung der Schweiz als permanenter Kompromissbildungsprozess [Swiss VET as permanent process of creating a compromise]. In J. Seyfried, S. Seeber & B. Ziegler (Eds.), *Jahrbuch der berufs- und wirtschaftspädagogischen Forschung* (pp. 43–58). Barbara Budrich. https://www.pedocs.de/volltexte/2017/12703/pdf/JBWF_2016_Gonon_Zehnder_Die_Berufsbildung_der_Schweiz_als_permanenter_Kompromissbildungsprozess.pdf

Gonon, P. (2016). Zur Dynamik und Typologie von Berufsbildungssystemen – Eine internationale Perspektive [Dynamic and typology of VET systems – an international perspective]. *Zeitschrift für Pädagogik, 62*(3), 307–322. https://www.pedocs.de/volltexte/2019/16760/pdf/ZfPaed_2016_3_Gonon_Zur_Dynamik_und_Typologie.pdf

Halbeisen, P., Müller, M., & Veyrassat, B. (2017). *Wirtschaftsgeschichte der Schweiz im 20. Jahrhundert* [Swiss economic history in the 20th century]. Schwabe.

Hall, P. A., & Soskice, D. (2001). *Varieties of capitalism: The institutional foundations of comparative advantage*. Oxford University Press.

Helfferich, C. (2011). *Die Qualität qualitativer Daten: Manual für die Durchführung qualitativer Interviews* [The quality of qualitative data: Manual for performing qualitative interviews]. VS Verlag für Sozialwissenschaften.

Hotz-Hart, B. (2008). Erfolgskonzept "duale Berufsbildung" im Wandel [The transformation of "dual VET" as key to success]. In T. Bauder (Ed.), *75 Jahre eidgenössisches Berufsbildungsgesetz: Politische, pädagogische, ökonomische Perspektiven* (pp. 93–127). Hep.

Keller, M., & Kurzen, H. P. (2012). Intakte Zukunftschancen für Schweizer Lebensmittelproduktion [Sound opportunities for the future of Swiss nutrition production]. *Die Volkswirtschaft. Das Magazin für Wirtschaftspolitik, 4*, 32–33.

Krummenacher, J. (2018). *Die Schweizer Berufsbildung geht in die Offensive* [Swiss VET takes action]. NZZ online. https://www.nzz.ch/schweiz/schweizer-berufsbildung-geht-in-die-offensive-ld.1344920

Kruse, J. (2015). *Qualitative Interviewforschung: Ein integrativer Ansatz* [Qualitative interview research: An integrative approach]. Beltz Juventa.

Mahoney, J. (2000). Path dependence in historical sociology. *Theory and Society, 29*(4), 507–548. https://doi.org/10.1023/A:1007113830879

Mayer, K. U., & Solga, H. (2008). *Skill Formation: Interdisciplinary and Cross-National Perspectives*. Cambridge University Press. https://doi.org/10.1017/CBO9780511499593.002

Meuser, M., & Nagel, U. (2009). Experteninterview und der Wandel der Wissensproduktion [Expert interviews and changing knowledge production]. In A. Bogner, B. Littig & W. Menz (Eds.), *Experteninterviews: Theorien, Methoden, Anwendungsfelder* (3rd ed., pp. 35–60). VS Verlag für Sozialwissenschaften.

Meuser, M., & Nagel, U. (2010). ExpertInneninterview: Zur Rekonstruktion spezialisierten Sonderwissens [Expert interviews: Reconstructing specialised knowledge]. In R. Becker & B. Kortendiek (Eds.), *Handbuch Frauen- und Geschlechterforschung: Theorie, Methoden, Empirie* (3rd ed., pp. 376–379). VS Verl. für Sozialwissenschaften.

Meyer, U. (2007). Auswirkungen der Berufsbildungsreform auf Unternehmen [Effects of the VET reform on firms]. In R. Dubs & E. Seidl (Eds.), *Berufsbildung im Lichte der neuen Gesetzgebung: Liber amicorum zum 60. Geburtstag von Professor Edit Seidl* (pp. 101–108). Verlag Neue Zürcher Zeitung.

Meyrat, M. (2000). Gestaltung institutioneller Handlungsspielräume. Reaktionen auf gewandelte Rahmenbedingungen in den sozialpartnerschaftlichen Beziehungen dreier Branchen [Designing institutional opportunities to act. Reactions on changing conditions of social partnership in three industries], 1980-1998. In K. Armingeon & S. Geissbühler (Eds.), *Gewerkschaften in der Schweiz. Herausforderungen und Optionen* [Trade unions in Switzerland. Challenges and options] (pp. 191–218). Seismo.

Organization for Economic Cooperation and Development. (2018). *Seven questions about apprenticeships. Answers from international experience*. (OECD reviews of Vocational Education and Training). OECD. https://doi.org/10.1787/9789264306486-en

Oesch, D. (2011). Swiss trade unions and industrial relations after 1990. A history of decline and renewal. In C. Trampusch & A. Mach (Eds.), *Switzerland in Europe: Continuity and Change in the Swiss Political Economy* (pp. 82–102). Routledge.

Pierson, P. (2000). Increasing returns, path dependence and the study of politics. *The American Political Science Review, 94*(2), 251–267. https://doi.org/10.2307/2586011

Rauner, F., & Wittig, W. (2009). Deutschland [Germany]. In Bertelsmann Stiftung (Ed.), *Steuerung der beruflichen Bildung im internationalen Vergleich* [Governance of VET internationally compared] (pp. 155–196). Verlag Bertelsmann Stiftung. https://www.bertelsmann-stiftung.de/de/publikationen/publikation/did/steuerung-der-beruflichen-bildung-im-internationalen-vergleich/

Rosenmund, M. (2019). Governance-Regime und politische Kultur – Eine schwer zu trennende Verbindung [Governance regimes and political culture – A relation that is difficult to seperate]. In R. Lager & T. Brüsemeister (Eds.), *Handbuch Educational Governance Theorien* [Handbook educational governance theory] (pp. 523-546). VS Verlag für Sozialwissenschaften.

Roth, U. (2007). Gute Perspektiven für die Schweizer Elektro-, Feinmechanik- und Uhrenindustrie [Good prospects for Swiss electro, precision mechanics and watchmaking industry]. *Das Magazin für Wirtschaftspolitik, 80*, 39–43. https://dievolkswirtschaft.ch/content/uploads/2016/06/2007_10-D1.pdf

Staatssekretariat für Bildung, Forschung und Innovation. (2020). Datenbank Berufsentwicklung auf Sekundarstufe II [Database for VET development]. SBFI. https://www.sbfi.admin.ch/sbfi/de/home/bildung/berufliche-grundbildung/datenbank-berufsentwicklung-auf-sekundarstufe-ii.html

Staatssekretariat für Bildung, Forschung und Innovation. (2017). *Berufsbildung 2030. Vision und strategische Leitlinien. Hintergrundbericht zum Leitbild* [VET 2030. Visions and strategical guidlines. Guidlines' review]. SBFI. https://berufsbildung2030.ch/images/_pdf_de_en/rapport_d.pdf

Schweizerischer Gewerbeverband, Staatssekretariat für Bildung, Forschung und Innovation, & Schweizerische Berufsbildungsämter-Konferenz. (2014). *Orientierungshilfe für die Schweizerischen Kommissionen für Berufsentwicklung & Qualität* [Guideline for the Swiss commissions for VET development and quality]. berufsbildungs.ch. https://www.berufsbildung.ch/dyn/bin/20504-20516-1-orientierungshilfe_sgv_deutsch_def.pdf

Schweizerisches Dienstleistungszentrum Berufsbildung/Berufs-, Studien und Laufbahnberatung. (2018). Die 22 Berufsfelder nach Zihlmann [The 22 vocational fields according to Zihlmann]. SDBB. https://edudoc.ch/record/106589/files/Berufsfelder.pdf?version=1

Seitzl, L., & Emmenegger P. (2019). How agents change institutions: Coalitional dynamics and the reform of commercial training in Switzerland. *Business and Politics, 21*(2), 145–171. https://doi.org/10.1017/bap.2018.21

Stalder, B. E. (2011). *Das intellektuelle Anforderungsniveau beruflicher Grundbildungen in der Schweiz. Ratings der Jahre 1999-2005* [Intellectual demands for VET in Switzerland. Ratings of the years 1999-2005]. Institut für Soziologie der Universität Basel. https://www.tree.unibe.ch/e206328/e305140/e305154/files305344/Stalder_2011_IAN_Technischer_Bericht_de_ger.pdf

Staatssekretariat für Wirtschaft. (2016). *Fachkräftemangel in der Schweiz. Indikatorensystem zur Beurteilung der Fachkräftenachfrage* [Skills shortages in Switzerland. Indicators for the evaluation of skill demand]. https://www.seco.admin.ch/seco/de/home/Publikationen_Dienstleistungen/Publikationen_und_Formulare/Arbeit/Arbeitsmarkt/Fachkraeftebedarf/indikatorensystem-zur-beurteilung-der-fachkraeftenachfrage.html

Strebel, A., Engelage, S., & Baumeler, C. (2019a). Der Beitrag der institutional work-Perspektive zu Educational Governance. Dezentrale institutionelle Arbeit in der Berufsbildung [The contribution of institutional work to educational governance. Decentral institutional work in VET]. In R. Langer & T. Brüsemeister (Eds.), *Handbuch Educational Governance Theorien* (pp. 201–218). Springer Nature.

Strebel, A., Emmenegger, P., & Graf, L. (2019b). Governance der Berufsbildung: Eine systematische Analyse der Organisationen der Arbeitswelt. Die vielen Motoren der Berufsbildung. Schweizerische Gesellschaft für angewandte Berufsbildungsforschung [Governance in VET: A systematic analysis of the world of work organizations. The many motors of VET]. *SGAB*. https://www.sgab-srfp.ch/de/newsletter/die-vielen-motoren-der-berufsbildung

Thelen, K. (2004). *How institutions evolve: The political economy of skills in Germany, Britain, the United States, and Japan*. Cambridge University Press. https://doi.org/10.1017/CBO9780511790997

Trampusch, C. (2014). Berufsausbildung, Tarifpolitik und Sozialpartnerschaft: Eine historische Analyse der Entstehung des dualen Systems in Deutschland und Österreich [VET, wage policy and social partnership: A historical analysis of the emergence of the dual system in Germany and Austria]. *Industrielle Beziehungen, 21*(2), 160–180. https://www.jstor.org/stable/24330838?seq=1#metadata_info_tab_contents

Wettstein, E., & Gonon, P. (2009). *Berufsbildung in der Schweiz* [VET in Switerland]. hep.

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How Florist Apprentices Explore Bouquet Designs: Supporting Design Space Exploration for Vocational Students

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Abstract

Context: Exploring the design space is an important process in a design task. In this study, we considered design space exploration for the learners in vocational education and training (VET). The goal of the study was to investigate how they explore the design space while focusing on the effect of a graph-like interface on the learner's understanding of the design space. With florists as the target profession, we investigated how the apprentices explore design variations, what they would gain from such activity, and how we can support this process.

Approach: We developed a web application called BloomGraph that allows learners to explore design variations. It provides a graph-based interface that enables the systematic variation of design. Using the BloomGraph application, we conducted an experimental study with 44 florist apprentices in Switzerland to investigate the effect of the graph-based interface which provides a structured way of exploring the design space. The experimental group was given the graph-based interface to explore design variations while the control group had a linear-based interface. We compared them in terms of the number of bouquets explored, time of exploration, diversity of bouquets explored, and the learning gain in terms of the

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understanding of the design space measured using pre and post-tests. We also analyzed the strategies adopted by the participants for the graph navigation and the visual exploration behavior using the eye gaze data.

Findings: Our analysis shows that the graph-based interface fosters a better understanding of the size of the design space and more efficient navigation towards a goal design in terms of the number of intermediate designs but with longer exploration of each intermediate design compared to the linear-based interface. Regarding the behavioral patterns in graph exploration, the participants who showed more strategic behavior in the design choices acquired a better understanding of the design space. Additionally, we trained a model that predicts the next choice of a learner using eye tracking data. It provides a reasonable accuracy that opens new possibilities for future studies.

Conclusion: The findings of this study support the feasibility of design space exploration as a digital activity for VET learners and show how the learners can benefit from it. The contribution of the paper includes the validation of the idea with florist apprentices and the demonstration of how the process can be supported using a structured interface and the learner behavior analysis. This paper shows how a design exploration activity can provide an added value in the learning of an apprentice in a design-related VET system.

Keywords: Vocational Education and Training, VET, Learning Activities, Learning Experience, Design Exploration, Educational Technology

1 Introduction

The majority of the vocational education and training (VET) systems in Switzerland have a dual-track structure where students learn in schools for one or two days per week while they do an apprenticeship at workplaces for the remaining days. Their professional competence is developed from their experience in the workplace and reinforced by the theoretical knowledge learned in school. The idea behind the dual-track system is based on the concept of learning through experience, which has been explored with various theoretical models, such as experiential learning and situated learning (Kolb & Kolb, 2009; Lave & Wenger, 1991). The dual-track approach is particularly well-suited in VET systems when the profession involves handcraft and practical design tasks since the importance of hands-on experience is greater in such cases. For example, the jobs of wood craftsmen, fashion designers, jewelry makers, textile designers, ceramic designers, gardeners and florists all involve the creation of new designs where the practical experience plays a major role in their learning.

Although the dual VET is considered an effective system for developing professional competence, one of the main challenges is to provide a rich experience. The practical experience

gained from a workplace is often limited to the specific situations to which the apprentices are exposed and it does not usually cover the whole spectrum of the skills related to the profession. This limitation of experience is introduced by the type and the style of the workplace. Some companies are specialized in very specific tasks within the profession. For example, a florist apprentice working at an airport flower shop can be repeatedly making bouquets of the same design for a welcoming purpose and it is unlikely that he or she will have much experience on wedding or funeral bouquets during the apprenticeship. Furthermore, companies often establish their own style of design and the experience as an apprentice is biased towards the style of the company. And lastly, the tasks given to the apprentices are usually distant from the ones they will have to perform further down their career path. As an apprentice, they may make the daily flower, but not get the chance to do the original designs.

Our interest is on how to enhance the learning experience of VET apprentices by supporting their exploration through digital variations of designs. Exposure to design variations is an important part of learning in most design-related vocations. It can help the learners in acquiring a better understanding of the design space which plays an important role in finding solutions to a design task (Dobricki et al., 2020; Kolodner & Wills, 1993; Kulkarni et al., 2014; Tohidi et al., 2006). However, in the current situation, an apprentice in the workplace may be tasked with making a single design without having the opportunity to explore many designs and understand how the design is one of many possible solutions to the problem. For example, imagine a florist apprentice who made a wedding bouquet at the workplace. Her experience in the real world might end there, but with an additional digital activity, she can expand her experience from making one bouquet to exploring many variations of the design.

In this paper, our focus was on florists as the target profession and we specifically investigate how we could support the exploration of the design space. In order to allow florist apprentices to explore variations of a design, we implemented a web application called "BloomGraph". BloomGraph provides a graph-based interface to navigate through flower bouquet designs. The key concept behind the design of BloomGraph is the axes of transformation – each axis of the graph leads to transforming a particular attribute of the design and, therefore, learners can systematically navigate the design space. We hypothesize the positive effect of the disentanglement of design attributes on understanding of the design space. While it is common in the field of cognitive science to consider design as an exploration of the combinatorial space of independent design features, it might not be the case for apprentices. They might not be able to mentally construct multidimensional abstract space or feel comfortable to navigate through it as they are often very much concerned by the concrete shapes of their craft (Ngoon et al., 2019). This concern has triggered the question for our experimental study: Given a digital tool that provides variations of bouquet designs, how would florist apprentices explore the space? We investigate how they explore a set of variations focusing on the effect on their understanding of the structure of the given dataset. Specifically, we address

two research questions in order to achieve the goal: (*RQ1*) What is the effect of the graph interface on the design exploration in terms of their understanding of the design space and (*RQ2*) What are the strategic behaviors of the learners in the graph exploration?

Through this paper, we contribute to apprentice experiences in VET systems. We demonstrate how apprentices in a VET system can enrich their experience by exploring design variations in the digital space and how they can benefit from this additional experience. The experimental study presented in this paper shows how the learning outcome is affected by a graph-based interface for exploration and the exploration strategy adopted.

2 Related Studies

The benefits of examples and variations in a design task have been demonstrated in many studies. Exposure to design alternatives provides awareness of the design space of potential options (Kolodner & Wills, 1993). Additional value is provided through the design process as people recognize and compare the alternatives (Tohidi et al., 2006). When comparing designs, learners are focused on the common relational structure, aiding abstraction of the underlying schema (Gick & Holyoak, 1983). The benefit of having examples in terms of understanding the design space is the core idea supporting our work presented in this paper and tested in the reported study.

While having examples can provide some benefits in a design task, there are mixed results to their effect in terms of design outcome. One negative effect is the conformity toward examples. The studies by Marsh et al. (1996) and Smith et al. (1993) show that design outcomes are likely to contain features of the examples and the conformity effect is increased with the increased number of examples. However, the negative effect of examples is debatable as there are also many positive results in the literature. Exposure to multiple designs can reduce fixation in a design task (Jansson & Smith, 1991) and early and repeated exposure to examples improves creativity in design (Kulkarni et al., 2014).

These mixed results may be due to the support that is provided around the use of examples. During the learning process, it is often not enough to just provide a resource to learners but scaffolds may need to be provided to guide the integration of the resource into the learning process (Durkin & Rittle-Johnson, 2012; Kollar et al., 2006; Roll et al., 2011). In the case of examples, it is important to investigate how people explore the given examples and what is the effect of the exploration. Without exploration, people often interpret the frame of the design problem too narrowly (Kershaw & Ohlsson, 2004) and designers may choose a design concept too early and fail to identify a valuable direction (Cross, 2004). In terms of the exploration strategies, Ball et al. (2004) compare novices and experts on how they make use of examples in design analysis. In their study, experts show more schema-driven use of examples than case-driven, with respect to novices. Najar et al. (2015) show that the students

with higher levels of knowledge pay more attention to the schema of the data than the weaker students. Our interest lies in the same domain as these studies. In this paper, we investigate how people explore given designs while focusing on the effect on their understanding of the structure of the given design space.

As the way one explores design examples has an effect in a design task, some studies have investigated how to support the design exploration. Lee et al. (2010) propose an interactive example gallery for a web design task. Their study shows that structured corpus navigation can help users find inspirational examples and facilitate design. Ritchie et al. (2011) show that a systematic design exploration tool can help users finding relevant and inspiring design examples. Their tool allows users to explore the examples ordered according to the styles. Some studies propose methods to generate design variations (Alhashim et al., 2014; Talton et al., 2009); however, they focus on the algorithm rather than how they can be used in a learning context. Our study also proposes a design exploration tool for a design task, but what differentiates it from the previous work is that it allows learners to explore the design space by actively selecting what features to vary. We use the design variations that are systematically generated based on the current design as a means of exploring the design space.

As we are proposing design space exploration as a digital activity that would take a part in the learning experience of VET learners, it is important to consider how it can fit in the context of VET. One of the issues in the dual VET systems is that apprentices often perceive the gap between different learning locations (Taylor & Freeman, 2011) and the knowledge learned often remains encapsulated in its original context (Renkl et al., 1996). The experience from workplaces is usually concrete as it is situated in the target field, however, the experience per se is often not enough (Boud et al., 2013; Kolb, 1984). In order to enrich the workplace experience and better connect to the knowledge from other contexts, Schwendimann et al. (2015) propose a pedagogical model called "Erfarraum" for designing educational technologies for dual VET systems. The Erfarraum model proposes the design of shared digital spaces for reflecting on experiences acquired in different contexts in which VET takes place. It does not refer to a specific technology for digital learning, but rather a framework for designing a digital activity that allows bridging the gap that exists between different learning contexts. And the activity in the digital space should allow learners to reflect on their real-world experiences by augmenting and enriching them. The design of our study is based on the Erfarraum model where we consider design space exploration as a means of enriching the real-world experience.

There have been some recent efforts in this direction to design a digital activity that fosters reflecting on experiences in dual VET systems. One of the ways that have been explored is the use of online learning journals. Cattaneo et al. (2015) have studied the use of online learning journals for apprentice chefs to capture workplace experiences and share them in school classrooms. They reported positive results in terms of effectiveness and satisfaction.

In a similar study, Mauroux et al. (2016) showed that promoting reflective writing in the learning journals had a positive effect on the metacognitive learning strategies as well as the performance on the final exams. Other digital activities that share the same approach include augmenting video recordings from workplaces for chefs and car mechanics (Motta et al., 2014), tabletop activity that allows simulating warehouse layout for logisticians (Cuendet et al., 2013), and augmented reality application for carpenters that lets you apply loads and visualize forces on physical structures (Lucignano, 2018). These studies demonstrated positive effects on VET learners in terms of their motivation and academic performance. Based on the positive findings from these examples, this paper also studies how a digital activity can enrich the experience of VET. Considering design space exploration as a means to achieve the goal, our focus is on understanding the behavior of learners and how it affects the learning outcome.

3 BloomGraph

For this study, we have developed a web application called BloomGraph that can support florist design exploration (Kim et al., 2019). The interface of the BloomGraph application is shown in Fig. 1. As seen on the left side, the navigation graph consists of the center node that shows the current bouquet design and four proposed variations around it. The proposed design in each axis is a variation of the current bouquet in terms of a specific attribute: Color, form, texture and spacing. These attributes were chosen through discussions with florist teachers to align with the concepts of bouquet designs that were being taught. When a user selects one of the variations, it comes to the center and a set of new variations of that design are proposed. Above the graph, there is a history bar that shows all the designs the user went through. Using the history bar, a user can backtrack to previous designs. On the right side, there is an interactive 3D viewer. The current bouquet design is shown in 3D and the user can rotate or zoom in/out. In the viewer, the user can also see the names of flowers by hovering the mouse pointer over them.

BloomGraph allows users to explore the design space as they follow the nodes in a graph. In the graph, each axis leads to a different variation of the current design. By clicking the nodes in different axes, users can vary the design systematically in terms of the important attributes, thus providing a structured way of exploring the design variations. The attributes that make the design are disentangled by the interface design so that learners can consider design as the exploration of the combinatorial space of independent design features. As users go through a series of designs as they travel along the nodes, the history bar is the way to show them where they have been and where they are now. It allows users to not only backtrack to previous stages, but also visually see the exploration path while going through the designs.

The BloomGraph application is implemented using *Meteor* framework written in *JavaScript*. For the front-end rendering, we used *React* and *D3.js* libraries. The interactive 3D viewer is implemented using the API provided by *BloomyPro* (BloomyPro, 2019).

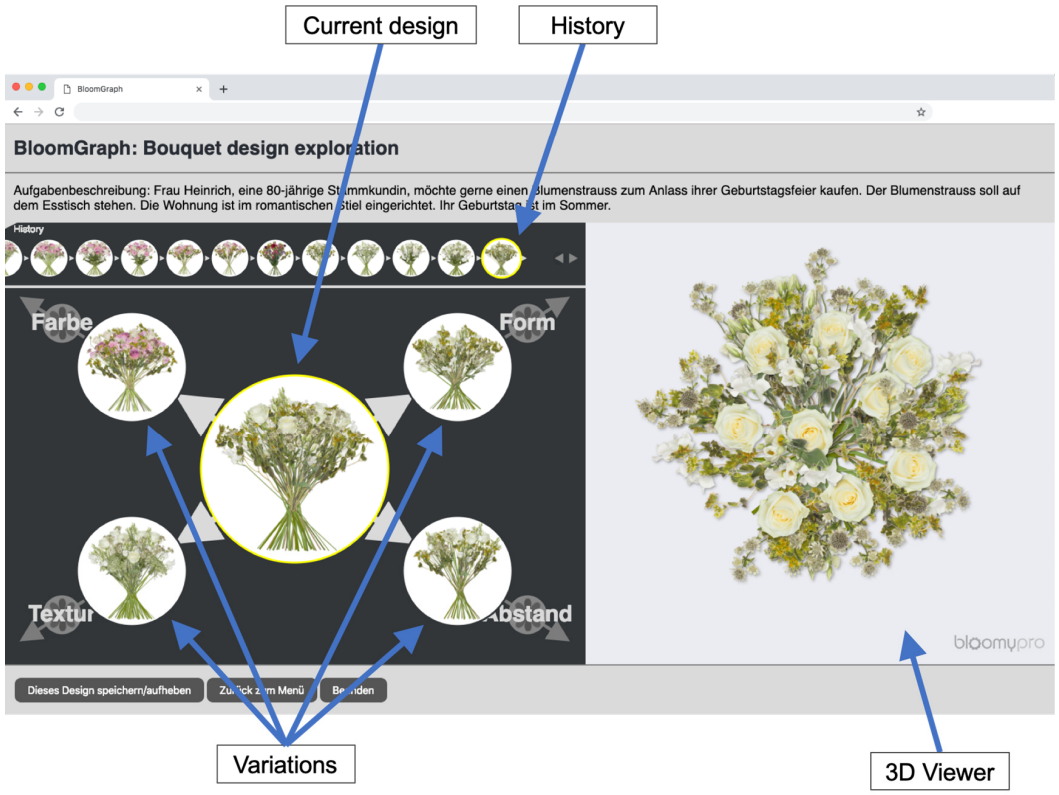


Figure 1: BloomGraph Application

4 Methods

In this section, we describe the details of the experimental study we conducted using BloomGraph and our analysis methods. As mentioned in the introduction, the goal of the experiment is to investigate how florist apprentices would explore the space of design variations given the graph-based interface of BloomGraph.

4.1 Experimental Setup

Participants

In order to recruit the participants for the experiment, we first contacted florist teachers in vocational schools in Switzerland. Four teachers from three schools agreed to run the experiment in their classes. We did not have any criteria for eliminating students and invited all the students from the classes to participate. As the result, 44 florist apprentices (43 females and 1 male) participated in this study and they were aged between 15 and 61 years (M = 28.4, SD = 15.2). The unbalanced gender ratio comes from the nature of the profession. The wide range of the age is due to one of the classes being a retraining. Thirty-four subjects were in their first year of the three-year program of the basic vocation education and the remainder in their second year. All participants were asked to sign the consent form if they agreed to participate after reading the information sheet. Participants under 18 years old had to provide a signed parental consent form, which had been distributed to them two weeks in advance of the experiment.

Experimental Design

For the study, we used a between-subjects design with 23 participants in the experimental condition using the graph-based interface of the BloomGraph application and 21 participants in the control condition using the linear-based interface. We controlled for the type of the class and the school year when assigning the participants to the two conditions.

Procedure

The task for the participants was to select a bouquet design that is most appropriate for a virtual customer. Together with a florist teacher, we developed two scenarios that resemble real-world situations – first scenario for the birthday party of an old lady and the second one for a wedding. Additional details given to the participants included basic customer information, when and where the event was taking place, and their preference on colors.

The experiment started with the general introduction of the study. Participants signed the consent form if they agreed to participate. Then they were asked to do a pre-test. Once they finished the pre-test, we went through an example tutorial together so that they could familiarize with the interface. The tutorial was given in the interface that they were assigned to base on the grouping. The example tutorial did not involve flower bouquets, but some simple geometric primitives so that they would focus on the interface, not the designs themselves. Once they finished the tutorial, they were given the actual tasks of selecting the bouquet designs for the virtual customers. They were asked to do two exercises, one for each scenario. The order of the scenarios was counterbalanced. Once the participants completed the two tasks, they were asked to do a post-test followed by a questionnaire to gather basic demographic information and the feedback on their experience with the application.

Materials

For the task, the participants either worked with a graph-based interface or linear-based interface depending on their assigned condition. The graph-based interface was designed as described in the previous section. It disentangles the four dimensions of the design space and presents the bouquets in a structured manner. For the control condition, linear-based interface is used and it is shown in Fig. 2. In the linear-based interface, four random variations of the current design are proposed in a linear formation. It is the same dataset as the experimental condition, presented in an unstructured way. It resembles the way people go through a catalog or a search result. In order to provide equal amount of information as the experimental condition, each variation in the linear condition comes with a tag that shows which attributes have been changed from the current design. As with the graph condition, to control for the availability of other features, the participants had access to their history and the 3D viewer. The difference between the two interfaces is the way we present the same data and it is to test our hypothesis on the effect of a graph interface on the design exploration.

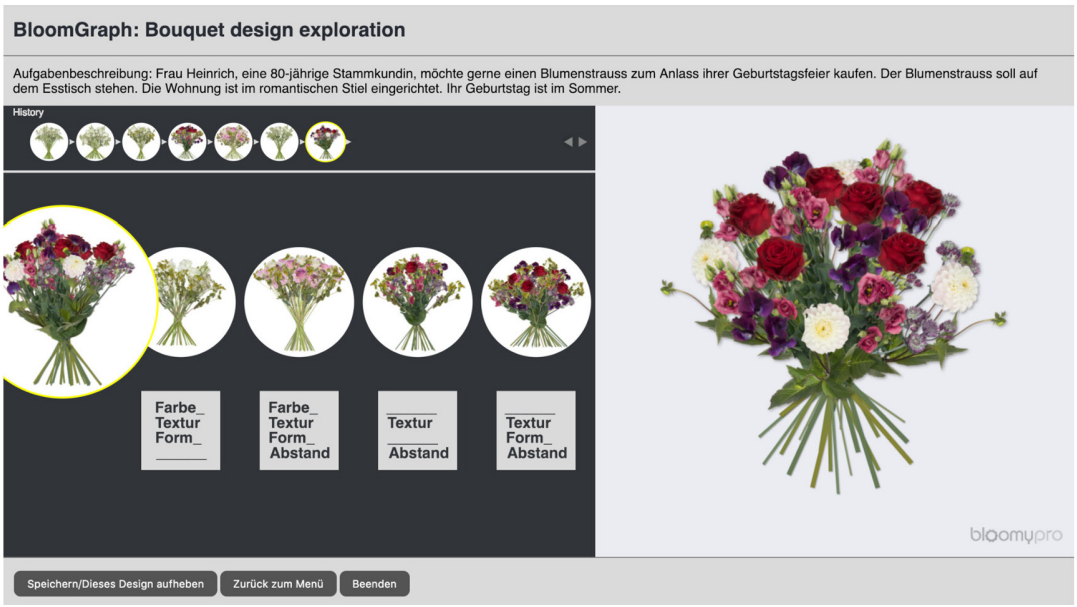


Figure 2: Linear Interface for the Control Condition in the Experiment

For each scenario, we created a set of bouquet designs. They were created systematically so that users can vary one attribute of the design at a time. Each attribute could take one of three values we designed (e.g., the color attribute, the main theme color of the bouquet, can be either red, pink or write). Combining the three values for each of the four attributes, the dataset consists of 81 bouquet designs per scenario.

To measure the participants' learning of the design space, we created pre-test and post-test measures. In particular, we wanted to see if they could understand the bouquet design process as a combinatorial problem where a design is a combination of attributes that can take different values. We were interested in how their understanding can be improved through the BloomGraph activity. We designed two types of questions – one on identifying the design that shares an attribute with a given set of designs and the other on identifying the most appropriate design that could be placed in a missing spot in a connected structure of designs. The questions were multiple choice questions and the participants were asked to choose the one that was most appropriate. Each test was made up of five questions of each type and each question was worth 10 points, therefore the maximum score of 100 points. We created two versions of tests and counterbalanced their use as a pre-test and post-test.

A questionnaire was given at the end of the experiment and it included questions on demographic information and their experience with the BloomGraph application. In terms of their experience with their application, we asked five 7-point Likert scale questions on the usability and satisfaction. Additionally, we asked them to provide an estimate for the total number of bouquets in the given dataset for each scenario during the experiment. Estimation on the size of the dataset is one of the factors that reflect the participant's understanding of the given space.

Measures

During the experiment, we collected data in two ways. All the interactions of the users with the interface of the application have been logged. The log included the designs they went through and the time stamp for each action. Using the log, we can analyze the behavior of users and the strategies adopted by them. In addition to the application log, we recorded the eye gaze of the participants. We used a screen-based eye tracking device from SMI and recorded the binocular gaze at 250 Hz. The purpose of the eye gaze recording is to investigate the visual behavior of users.

4.2 Analyses

In order to answer the two research questions, we analyzed the data in two parts. The first part of the analysis is to answer the first research question on the effect of the graph interface on design exploration. The second part of the analysis focuses on the behaviors of the participants using the graph-based interface in order to answer the second research question on the strategies adopted in the graph exploration. Details of the measures we analyzed are described in this section.

In the first part of the analysis, to see the effect of the graph interface on the exploration patterns of the learners, we compared the experimental group with the control group on different metrics: Number of bouquets explored before making a choice, number of revisits

to the same bouquets, total exploration time, and time spent per bouquet. We also compared the learning gains between the two conditions. We used the difference between the post-test and the pre-test scores as the learning gain. Another factor we looked at is the estimation on how many bouquets they think there were in each scenario. We also investigated the diversity of the bouquets they went through. The diversity measure was calculated for each participant using the concept of entropy as follows:

$$S = -\sum_{i=1}^{N} \sum_{j=1}^{M} \left(p_{ij} \log(p_{ij}) \right)$$

Where N is the number of attributes of the bouquet design and M is the number of values that each attribute can take. And p_{ij} is the percentage of value j for attribute i in all the bouquets that one participant visited. In the experiment, $N = 4$ and $M = 3$.

In the second part of the analysis, we took a closer look at the experimental group in order to investigate the strategies adopted in the graph exploration. As our interest is on the strategy used for navigating different dimensions of attributes, we looked at the sequences of the attributes that the participants selected, specifically the average number of consecutive clicks on one axis. Higher number of consecutive clicks in one axis means exploring more variations in terms of that attribute consecutively, or going deeper in that dimension. This strategy can be described as more consistent in choices since it has a priority on the consistency in attributes. On the other hand, lower number of consecutive clicks in one axis shows lower consistency in attribute choices, but higher priority on the diversity in exploration. For example, Fig. 3 shows two click sequences where the colors represent different attributes chosen to be changed. In our definition, Sequence 1 shows more consistent strategy whereas Sequence 2 is less consistent. The purpose of using this measure to characterize the strategy is to investigate the effect of the disentanglement of the dimensions on the exploration paths with respect to the dimensions.



Figure 3: Examples of Exploration Pattern

Regarding the second research question, we also investigated the visual exploration behavior using eye tracking data. In order to measure how visually explorative they are, we defined visual-explorative-ness with the number of fixations on the four proposed variations before

clicking one. This measure shows how much they visually explored the proposed options for making a choice. We looked at the correlation between the visual-explorative-ness and the consistency in the attribute choices in order to investigate the relationship between the visual behavior and the exploration strategy. Lastly, we investigated how we can use the eye gaze data to predict the next click of the learner. We used a support vector machine (SVM) to train the prediction model with the features extracted from the gaze data. We extracted features from the gaze events before each click and generated feature vectors. The feature vector included the number of fixations on each node, the time spent on each node, and the node with the maximum time spent. We randomly selected 80% of the eye tracking data to train the model and the remaining 20% was used to test the performance.

5 Results

As described in the previous section, we analyzed the data in two parts and we present the results in this section. For the statistical tests, we used Kruskal-Wallis test due to the non-normality of the distributions of data.

5.1 Graph vs. Linear Interface

Number of Bouquets and Exploration Time

Comparing the exploration behavior in the two conditions, we first observed that the number of bouquets participants explored for a task was significantly different ($\chi 2 = 8.60$, $df = 1$, $p < .01$). In the graph condition, they explored fewer bouquets ($M = 13.2$, $SD = 4.46$) before making their choices compared to the linear condition ($M = 18.5$, $SD = 9.42$). We observed a large variation in the linear condition. In terms of the exploration time, we observed that it was significantly longer in the graph condition ($\chi 2 = 5.71$, $df = 1$, $p < .05$). Therefore, in the graph condition, participants spent more time on fewer bouquets. The results are shown in Fig. 4.

Bouquets Visited

In terms of which bouquets the participants visited during the tasks, we analyzed the following factors: (*i*) Diversity of bouquets with the diversity measure defined above and (*ii*) number of revisits to the same bouquets. For the diversity of bouquets explored, we observed a significant difference between the two conditions ($\chi 2 = 5.71$, $df = 1$, $p < .05$) with the experimental condition having higher diversity. We also observed a significant difference between the two conditions in the number of revisits to the same bouquets ($\chi 2 = 15.6$, $df = 1$ $p < .001$). The experimental group showed a higher number of revisits ($M = 10.5$, $SD = 6.64$) compared to the control group ($M = 5.52$, $SD = 3.54$).

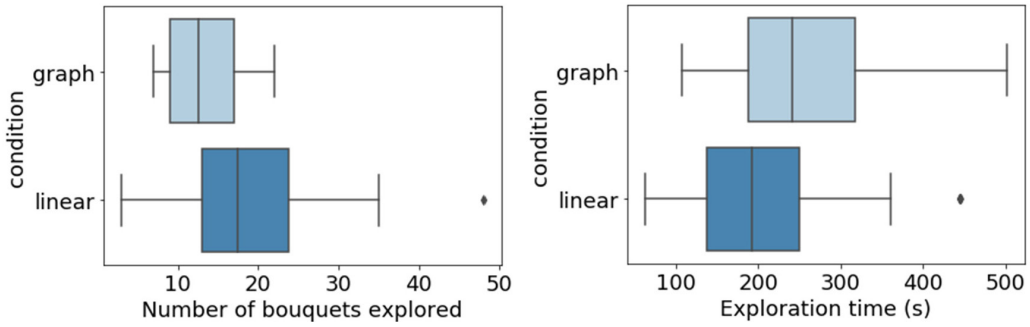


Figure 4: Comparison Between Graph and Linear Conditions

Learning Gain and Size Estimation

Regarding the effect of the graph-based interface compared to the linear-based interface, we looked at the learning gain and the accuracy of the estimation on the design space size. Although we observed positive learning gains in both the graph condition (M = 25.5, SD = 27.6) and the linear condition (M = 13.4, SD = 24.3), the difference between the two conditions was not significant ($\chi 2$ = 2.45, df = 1, p = .12). There was, however, a significant difference in the accuracy of the estimation on the design space size ($\chi 2$ = 12.3, df = 1, $p < .001$). From the questionnaire, the participants in the graph condition showed significantly better estimation on how many bouquet designs were present in a scenario (M = 52.8, SD = 12.1) compared to the linear condition (M = 29.0, SD = 14.4). The actual number of bouquet designs in each scenario was 81.

5.2 Strategies in Graph Exploration

Categorization Based on Exploration Strategy

In order to investigate the strategies of the participants on the graph exploration, we first investigated how consistent they are in terms of their choice of the bouquets in the graph axes. Fig. 5 shows the sequence of clicks in the graph condition. Using the measure of consistency defined above, we divided the participants in the graph condition (N = 23) into two groups. The group with higher consistency (N = 12) had 3.03 consecutive clicks in the same axis in average (SD = 0.81) and the group with lower consistency (N = 11) 1.45 clicks (SD = 0.17). The difference was significant ($\chi 2$ = 16.5, df = 1, $p < .001$).

With the categorization based on the consistency measure, we observed that the group of higher consistency had significantly higher learning gain compared to the group of lower consistency ($\chi 2$ = 5.77, df = 1, $p < .05$). Fig. 6 shows the learning gains of the two groups as well as that of the linear group. The difference between the high consistency group and the

linear group is also significant ($\chi 2 = 7.26$, $df = 1$, $p < .01$). Furthermore, another measure we looked at with respect to the exploration strategy is the estimation of the space size. We noticed that the consistency of their exploration was positively correlated to the accuracy of the estimation ($r = 0.48$, $p < .05$).

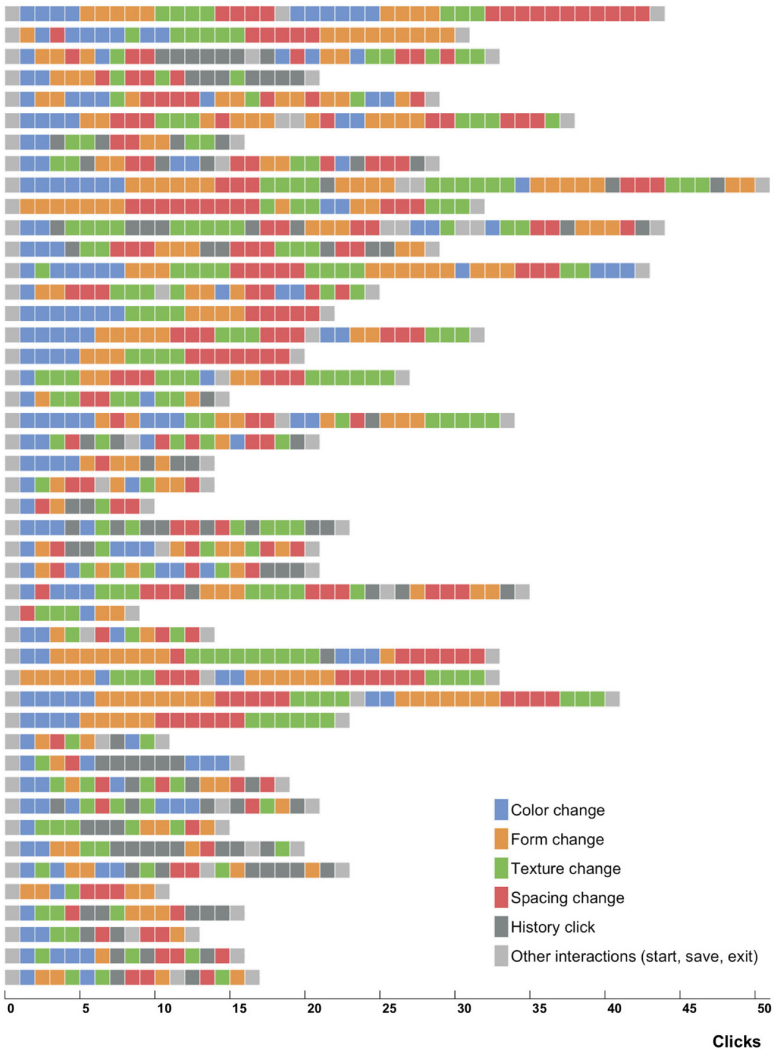


Figure 5: Sequences of Clicks in the Graph Condition

Note. Each row represents one trial and the colors represent different attributes selected to change. Note that the lengths of the sequences show the numbers of clicks, not the time.

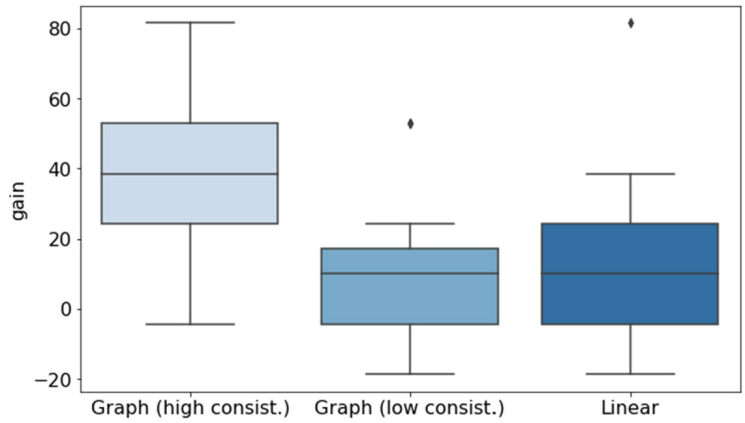


Figure 6: Comparison of the Learning Gains of the two Groups From the Graph Condition Along With the Linear Condition

Note. The two groups from the graph condition are based on consistency measure of their exploration strategies. The learning gain is calculated as the difference between the pre-test and post-test scores.

Visual Exploration and Prediction on Next Choice

Using the eye tracking data, we investigated visual exploration behavior of the participants. The group of higher consistency showed the visual-explorative-ness of 1.82 ($SD = 0.45$) and the group of lower consistency 2.41 ($SD = 0.35$). As individuals, we observed that the visual-explorative-ness is negatively correlated to the consistency in choices ($r = -0.57$, $p < .05$). In other words, the participants with higher consistency in attribute choices were also visually focused on each axis at a time. This result is logical and as expected since in order to be more divergent in choices, one would consider more options visually.

Using this correlation observed between the gaze behavior and the choices they make, we investigated whether we can predict the next choice in the navigation based on the eye gaze data. We trained a prediction model using SVM, as described in the previous section. This was done with different grouping – first on all participants in the graph condition then separately for the two groups with different strategies. In order to see how early we can predict a learner's next choice, we made the prediction every 2 seconds up to 12 seconds. The average interval between two clicks was 11.2 seconds. Fig. 7 shows the test result of the prediction models. The prediction accuracy for the high consistency group is the highest among the 3 groups and it reaches approximately 80% after 10 seconds. Overall, all 3 groups show a reasonable performance and the prediction accuracy reaches 50% as early as the first 3 seconds and over 70% in 10 seconds.

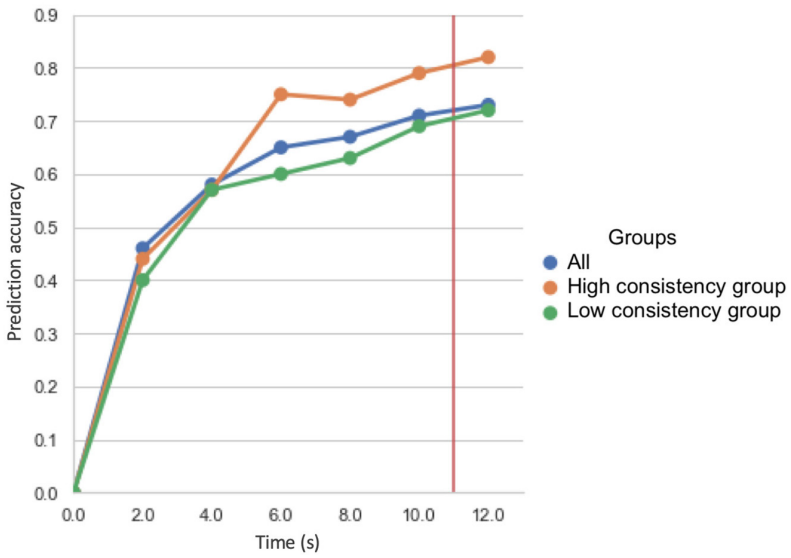


Figure 7: Prediction Result on the Attribute Choices

Note. Prediction is made every 2 seconds. The red vertical line shows average time taken before a click.

6 Discussion and Conclusions

The goal of this paper is to investigate how VET apprentices explore the design space and how we can support this process. In order to achieve this goal, we designed a bouquet design exploration application for florist apprentices and conducted an experimental study. The experiment was designed to answer two research questions on the effect of a graph-based interface and the strategies adopted by participants in the graph exploration.

Regarding our first research question on the effect of the graph interface on the design exploration, the analysis allows for a number of observations. First, the participants in the graph condition went through fewer number of bouquets before selecting final designs, compared to the ones in the linear condition. This is logical since the graph allows more direct navigation than the linear presentation. It is debatable whether it is better to navigate efficiently to the goal design or to be exposed to more designs (Jansson & Smith, 1991; Marsh et al., 1996). But what it shows us is that the apprentices were able to navigate using the graph and find their ways more efficiently. In terms of time, they spent more time on the intermediate bouquet designs before making their final choices. This also gives a hint that they are not just randomly selecting next ones on the graph, but trying to understand the structure. In terms of which bouquets they went through, the participants were exposed to more diverse designs

when using the graph-based interface. The graph group also showed a higher number of revisits to the same designs while exploring. Overall, we interpret these observations as the evidence of some strategy-driven behavior in the exploration that has been further investigated in the second part of the analysis. In terms of the understanding of the design space, the participants who used the graph-based interface provided significantly better estimations on the size of the design space after the activity. In summary, the graph-based interface led to more efficient navigation towards the goal, exposure to more diverse designs, and better understanding of the design space. These results are in agreement with the previous findings on the advantages of structured and systematic design exploration in design-related learning (Lee et al., 2010; Ritchie et al., 2011). Our findings show that the graph-based interface can support the design exploration and the effectiveness of such design exploration tool can be valid for VET learners.

The second research question was on the strategy in the graph exploration. With the group-ing of the participants of the graph condition based on how consistent they are in terms of their choices of attributes, we observed some interesting results. The participants with more consistent strategy showed higher learning gains and they also had better estimation on the size of the design space. Consistency in the graph exploration appears to be an effective strategy that leads to a better learning outcome in our measures. One possible explanation is that the disentanglement of dimensions allowed disentangled exploration which lead to a better understanding of the design space. On the other hand, the participants who had the strategy with lower consistency were less successful. Their behavior can be also seen as jumping among different attributes and trying to be opportunistic in finding what they like. It can be also interpreted as less strategic in the exploration. These results are in agreement with the findings of Ball et al. (2004) and Najar et al. (2015) on the advantage of strategic approach in design exploration. A schema-driven approach in example search can be more desirable in a design-related task and our study demonstrates it in terms of the understanding of the design space. Moreover, as we observed the correlation between the visual exploration behavior and the choices they make, we trained a prediction model that predicts the next bouquet choices with a reasonable accuracy using the visual features from eye tracking data. In summary, the strategy adopted by the learners in the graph exploration had a significant effect on the learning outcome in our experiment and the visual behavior provided additional insight into their exploration behavior which opens new possibilities for future studies.

Based on our analysis, the participants in both conditions showed positive learning gain from the BloomGraph activity in terms of understanding of the design space. This finding supports the idea of design space exploration as a means of enhancing the learning experience of VET apprentices while demonstrating another practice of the Erfarraum model. When we focused on the participants with graph-based interface, we observed that some of them be-

nefited more from having the structured way of navigation. We found that the exploration strategy adopted by the learners had a significant effect on the learning outcome. The question to be addressed now is how we can guide the learners so that they can maximize the benefit they take from the activity. One approach that could be suitable for digital applications like BloomGraph is the use of automated feedback. The result of the prediction model we presented in this study is interesting in this aspect. Based on the prediction of the behavior of a user, we can provide online feedback while the user is using the application. In this way, we can guide the learner so that they can adopt a desirable strategy in the exploration. It would be interesting as future work to investigate the effectiveness of different types of feedback such as direct/indirect or immediate/delayed feedback in this context (Corbett & Anderson, 2001; Roll et al., 2011).

The question we wanted to investigate in the experimental study was whether the apprentices in vocational education can understand conceptual design as a combinatorial problem of different attributes and navigate through them using a graph interface. This might sound as a trivial problem, but it might not be the case for the apprentices in vocational education as the process requires a certain level of abstraction. One might argue that designing a bouquet may not be a problem to be approached scientifically, but rather with a free mind of creativity. However, creativity is not unrelated to the understanding of the design space. Understanding what is available as a designer with the awareness of the constraints that exist in the problem space is an important aspect for creativity (Joyce, 2009; Rosso, 2014). We believe that fostering a better understanding of the design space through supporting design exploration has a positive impact on the creativity in a design task.

This paper demonstrated how a design exploration activity can provide an added value in the learning of an apprentice in a design-related VET system. The contribution of this paper is the validation of the idea with florist apprentices and we demonstrated how we can support the process by investigating the effect of a structured interface and the exploration strategy. Our results show that the apprentices can benefit from such activity by acquiring a better understanding of the design space and the learning outcome can be further improved by the graph-based interface as well as the strategy adopted in the exploration. The results support the potential of design exploration as a means of enhancing the learning experience of VET learners.

Although this work contributes to our understanding of designing digital activities for VET learners, there are limitations to the study that should be considered and addressed in future work. In this paper, we investigated the feasibility of design exploration for VET learners while focusing on their behavior. As we validated the feasibility of the idea, the next question is on how to design and integrate such activity to the learning journey of VET students. It is another research question of how it can be used to enhance the learning experience in a broader scale and it needs further investigation. It requires exploring the fit of

such digital activity to the dual-track VET systems, especially in connection to the real-world experience. Another factor to be explored is the generalizability of the results to other professions. While the current study focused on florist education, there are many design-related professions that could benefit from design space exploration and the cross-profession generalizability will be an interesting factor to investigate.

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References

Alhashim, I., Li, H., Xu, K., Cao, J., Ma, R., & Zhang, H. (2014). Topology-varying 3D shape creation via structural blending. *ACM Transactions on Graphics (TOG), 33*(4), 1–10. https://doi.org/10.1145/2601097.2601102

Ball, L. J., Ormerod, T. C., & Morley, N. J. (2004). Spontaneous analogising in engineering design: A comparative analysis of experts and novices. *Design Studies, 25*(5), 495–508. https://doi.org/10.1016/j.destud.2004.05.004

BloomyPro. (2019). *BloomyPro: 3d Floral Platform*. https://bloomypro.com/

Boud, D., Keogh, R., & Walker, D. (2013). *Reflection: Turning experience into learning*. Routledge. https://doi.org/10.4324/9781315059051

Cattaneo, A. A. P., Motta, E., & Gurtner, J.-L. (2015). Evaluating a mobile and online system for apprentices' learning documentation in vocational education: Usability, effectiveness and satisfaction. *International Journal of Mobile and Blended Learning (IJMBL), 7*(3), 40–58. https://www.researchgate.net/publication/277542530_Evaluating_a_Mobile_and_Online_System_for_Apprentices'_Learning_Documentation_in_Vocational_Education

Corbett, A. T., & Anderson, J. R. (2001). Locus of feedback control in computer-based tutoring: Impact on learning rate, achievement and attitudes. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 245–252. https://doi.org/10.1145/365024.365111

Cross, N. (2004). Expertise in design: An overview. *Design Studies, 25*(5), 427–441. https://doi.org/10.1016/j.destud.2004.06.002

Cuendet, S., Bonnard, Q., Do-Lenh, S., & Dillenbourg, P. (2013). Designing augmented reality for the classroom. *Computers & Education, 68*, 557–569. https://doi.org/10.1016/j.compedu.2013.02.015

Dobricki, M., Evi-Colombo, A., & Cattaneo, A. (2020). Situating vocational learning and teaching using digital technologies – A mapping review of current research literature. *International Journal for Research in Vocational Education and Training, 7*(3), 344–360. https://doi.org/10.13152/IJRVET.7.3.5

Durkin, K., & Rittle-Johnson, B. (2012). The effectiveness of using incorrect examples to support learning about decimal magnitude. *Learning and Instruction, 22*(3), 206–214. https://doi.org/10.1016/j.learninstruc.2011.11.001

Gick, M. L., & Holyoak, K. J. (1983). Schema induction and analogical transfer. *Cognitive Psychology, 15*(1), 1–38. https://doi.org/10.1016/0010-0285(83)90002-6

Jansson, D. G., & Smith, S. M. (1991). Design fixation. *Design Studies, 12*(1), 3–11. https://doi.org/10.1016/0142-694X(91)90003-F

Joyce, C. K. (2009). *The blank page: Effects of constraint on creativity* [Doctoral dissertation]. University of California. https://doi.org/10.2139/ssrn.1552835

Kershaw, T. C., & Ohlsson, S. (2004). Multiple causes of difficulty in insight: The case of the nine-dot problem. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 30*(1), 3–13. https://doi.org/10.1037/0278-7393.30.1.3

Kim, K. G., Oertel, C., & Dillenbourg, P. (2019). Bloomgraph: Graph-based exploration of bouquet designs for florist apprentices. In M. Scheffel, J. Broisin, V. Pammer-Schindler & A. Ioannou (Eds.), *Transforming learning with meaningful technologies* (pp. 727–731). Springer. https://doi.org/10.1007/978-3-030-29736-7_76

Kolb, A. Y., & Kolb, D. A. (2009). Experiential learning theory: A dynamic, holistic approach to management learning, education and development. In S. J. Armstrong & C. V. Fukami (Eds.), *The SAGE handbook of management learning, education and development* (pp. 42–68). Sage. https://doi.org/10.4135/9780857021038

Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development. P*rentice Hall*.

Kollar, I., Fischer, F., & Hesse, F. W. (2006). Collaboration scripts – A conceptual analysis. *Educational Psychology Review, 18*(2), 159–185. https://hal.archives-ouvertes.fr/hal-00703937/document

Kolodner, J. L., & Wills, L. M. (1993). Case-based creative design. *AISB QUARTERLY, 85*, 1–8. https://www.aaai.org/Papers/Symposia/Spring/1993/SS-93-01/SS93-01-015.pdf

Kulkarni, C., Dow, S. P., & Klemmer, S. R. (2014). Early and repeated exposure to examples improves creative work. In L. Leifer, H. Plattner & C. Meinel (Eds.), *Design thinking research. Building innovation eco-systems* (pp. 49–62). Springer. https://doi.org/10.1007/978-3-319-01303-9_4

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press. https://doi.org/10.1017/CBO9780511815355

Lee, B., Srivastava, S., Kumar, R., Brafman, R., & Klemmer, S. R. (2010). Designing with interactive example galleries. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 2257–2266. https://doi.org/10.1145/1753326.1753667

Lucignano, L. (2018). *Augmented reality to facilitate a conceptual understanding of statics in vocational education* [Doctoral dissertation]. Ecole Polytechnique Fédérale de Lausanne. https://infoscience.epfl.ch/record/253388

Marsh, R. L., Landau, J. D., & Hicks, J. L. (1996). How examples may (and may not) constrain creativity. *Memory & Cognition, 24*(5), 669–680. https://doi.org/10.3758/BF03201091

Mauroux, L., Zufferey, J. D., Rodondi, E., Cattaneo, A., Motta, E., & Gurtner, J.-L. (2016). Writing reflective learning journals: Promoting the use of learning strategies and supporting the development of professional skills. In G. Ortoleva, M. Bétrancourt & S. Billett (Eds.), *Writing for Professional Development* (pp. 107–128). Brill. https://doi.org/10.1163/9789004264830_007

Motta, E., Cattaneo, A., & Gurtner, J.-L. (2014). Mobile devices to bridge the gap in VET: Ease of use and usefulness as indicators for their acceptance. *Journal of Education and Training Studies, 2*(1), 165–179. https://doi.org/10.11114/jets.v2i1.184

Najar, A. S., Mitrovic, A., & Neshatian, K. (2015). Using eye tracking to identify learner differences in example processing. In C. Conati, N. Heffernan, A. Mitrovic & M. F. Verdejo (Eds.), *Artificial intelligence in education* (pp. 734–737). Springer. https://doi.org/10.1007/978-3-319-19773-9_104

Ngoon, T. J., Walker, C. M., & Klemmer, S. (2019). The dark side of satisficing: Setting the temperature of creative thinking. *Proceedings of the 2019 on Creativity and Cognition*, 591–596. https://doi.org/10.1145/3325480.3326581

Renkl, A., Mandl, H., & Gruber, H. (1996). Inert knowledge: Analyses and remedies. *Educational Psychologist, 31*(2), 115–121. https://doi.org/10.1207/s15326985ep3102_3

Ritchie, D., Kejriwal, A. A., & Klemmer, S. R. (2011). *d. tour: Style-based exploration of design example galleries*. Proceedings of the 24th annual ACM symposium on User interface software and technology (pp. 165–174). https://doi.org/10.1145/2047196.2047216

Roll, I., Aleven, V., McLaren, B. M., & Koedinger, K. R. (2011). Improving students' help-seeking skills using metacognitive feedback in an intelligent tutoring system. *Learning and Instruction, 21*(2), 267–280. https://doi.org/10.1016/j.learninstruc.2010.07.004

Rosso, B. D. (2014). Creativity and constraints: Exploring the role of constraints in the creative processes of research and development teams. *Organization Studies, 35*(4), 551–585. https://doi.org/10.1177/0170840613517600

Schwendimann, B. A., Cattaneo, A. A. P., Dehler Zufferey, J., Gurtner, J.-L., Bétrancourt, M., & Dillenbourg, P. (2015). The "Erfahrraum": A pedagogical model for designing educational technologies in dual vocational systems. *Journal of Vocational Education & Training, 67*(3), 367–396. https://doi.org/10.1080/13636820.2015.1061041

Smith, S. M., Ward, T. B., & Schumacher, J. S. (1993). Constraining effects of examples in a creative generation task. *Memory & Cognition, 21*(6), 837–845. https://doi.org/10.3758/BF03202751

Talton, J. O., Gibson, D., Yang, L., Hanrahan, P., & Koltun, V. (2009). Exploratory modeling with collaborative design spaces. *ACM Transactions on Graphics, 28*(5), 1–10. https://doi.org/10.1145/1618452.1618513

Taylor, A., & Freeman, S. (2011). "Made in the trade": Youth attitudes toward apprenticeship certification. *Journal of Vocational Education & Training, 63*(3), 345–362. https://doi.org/10.1080/13636820.2011.570455

Tohidi, M., Buxton, W., Baecker, R., & Sellen, A. (2006). *Getting the right design and the design right*. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 1243–1252). https://doi.org/10.1145/1124772.1124960

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Regional Disparities in the Training Market: Opportunities for Adolescents to Obtain a Company-Based Training Place Depending on Regional Training Market Conditions

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Abstract

Context: Due to limited geographical mobility, opportunities for adolescents interested in company-based training are primarily dependent on regional training offers. Competition for company-based training among adolescents varies regionally, and thus, the chance to obtain a training contract varies as well. In this article, we investigate the opportunities for adolescents to obtain company-based training depending on regional training market conditions. We assume that the advantages of obtaining a company-based training place exist in areas of decreased competition among interested adolescents. However, the question is whether those advantages will differ between adolescents depending on characteristics such as school achievement, socioeconomic status or migration background. Furthermore, we assume that, above all, market-induced ease-of-access to company-based training exists for occupations that face hiring challenges and indicates less occupational attractiveness.

Methods: The transition from school (after 9th and 10th grade) to company-based training is analysed using data from the German National Educational Panel Study (NEPS, starting cohort 4). This dataset is merged with the official regional training market data regarding local supply and demand ratio for training places (called "SDR") in the dual system of Vocational Education and Training in Germany. Logistic regressions are used to predict the probabilities of obtaining a training place. The focus lies on the interaction effects between

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SDR and adolescents' education-related characteristics (school certificates and grade point average), socioeconomic characteristics and migration backgrounds. Subgroup-specific analyses of different clusters of hiring challenges for trainee occupations are used to examine whether these effects are valid for all occupations.

Findings: The results confirm regional differences in obtaining a training place depending on the SDR. Here, applicant hierarchies according to educational achievement continue to exist if competition for company-based training among adolescents decreases. Beneficiaries are better-qualified adolescents with poorer GPAs. SDR hardly influences social disparities. However, the advantages of obtaining a company-based training place primarily exist for training occupations with hiring challenges when competition for company-based training among adolescents decreases. These occupations have a significantly lower occupational prestige (ISEI-08) compared to occupations with fewer hiring challenges.

Conclusion: The results make it clear that market-induced ease-of-access to company-based training is not necessarily an advantage. Because the findings indicate that the advantages pertain mainly to low-prestige occupations, it can be assumed that career-path disadvantages can arise down the road. Future studies should investigate this in more differentiated ways.

Keywords: Access to Education and Training, Equal Opportunity, Dual System, Training Market, Statistical Analysis, Vocational Education and Training, VET

1 Introduction

Several countries (for example, Austria, UK-England, Finland, Germany, Hungary, and Switzerland) implemented Vocational Education and Training (VET) systems in cooperation with companies (European Centre for the Development of Vocational Training (CEDEFOP), 2018; Poulsen & Eberhardt, 2016). The companies benefit from this system as their direct involvement and commitment to the training process meets their demand for skilled workers (Poulsen & Eberhardt, 2016). For adolescents, vocational training is crucial because it has been regarded as an initiator of vocational careers. Depending on the type of the training system, which differs between countries, adolescents could acquire their first vocational skills; most systems even enable the acquisition of formal qualifications (European Commission, 2012; The Organization for Economic Co-operation and Development [OECD], 2010). Participating in a VET could initiate several positive labour market outcomes for adolescents, including a faster transition into employment, a higher probability of first-job stability and less risk of employment with a qualification mismatch (CEDEFOP, 2013). Thus, adolescents' potential for individual occupational adjustments as well as the further guarantee of social

status and equal opportunity depends on this phase of life (Baethge et al., 2006). There is a large amount of evidence of the conditions necessary to achieving a company-based training place (see, for example, Beicht & Walden, 2017, 2018, 2019; Forsblom et al., 2016; Glauser & Becker, 2016; Goastellec & Ruiz, 2015; Holtmann et al., 2017; Seeber et al., 2019a). However, international research on obtaining a company-based training place has paid little attention to the effects of regional conditions within countries (like regional demography, educational context or economic structure) or shows mixed evidence (Holtmann et al., 2017). Nevertheless, investigating these effects has to be seen as important because the geographical mobility of adolescents interested in VET is often limited. For example, a lack of family support and financial resources or a poorly developed mobility infrastructure can impede the willingness of an adolescent to accept a training contract in a more remote region. Thus, due to mobility restrictions, adolescents often have to apply to regional training places.

Access to company-based training differs by country due to the different governance structures in the training market. In many countries, the signing of a training contract is common (European Commission, 2012; OECD, 2010; Poulsen & Eberhardt, 2016). The initiation processes of contracting and the participation of contracting parties often differ by countries. In addition to companies and applicants, in some countries, state institutions (e.g. schools) can be involved in hiring decisions and training contracts. Public subsidy programmes such as training-place guarantees can also regulate the training market. Market-mediated VET systems with training markets, which have a governance structure based on regular labour market characteristics, primarily exist in Germany, Austria and Switzerland (OECD, 2010; Kleinert et al., 2018). In these countries, adolescents actively apply to training places, and companies are responsible for their recruitment. Training contracts are finalised between companies and applicants by mutual agreement. Similar to traditional labour markets (see e.g. Borjas, 2013), the supply and demand for training places in such systems are usually not well-balanced in regional training markets. On the one hand, an imbalance can exist if the demand for training places (by adolescents) cannot be adequately satisfied by the supply side (by employer, i.e., excess demand). This situation is characterized by a high level of competition for company-based training among adolescents. On the other hand, the supply of company-based training may exceed demand (i.e., excess supply). In this case, adolescents can benefit if companies are confronted with hiring challenges due to fewer suitable applicants. Thus, companies are faced with the decision of keeping training places vacant or adjusting their hiring standards.[1] However, as long as a sufficient number of unsuccessful applicants remain available in the training market, one option that companies have is to downgrade the expected requirement profile of applicants. As a result, the chance to obtain a

1 From a long-term perspective, companies have to reconsider recruitment strategies and enhance the attractiveness of their vacant positions (Wieling & Borghans, 2001).

training place depends not only on the adolescents' performance potential but on the regional supply and demand for training places as well.

For example, in the German training market, current empirical analyses reveal that there are advantages for adolescents wishing to obtain a company-based training place when there is a higher ratio of supply and demand for company-based training in the regional training market (Beicht & Walden, 2017; Eckelt & Schauer, 2019; Lex & Zimmermann, 2011). The question is whether these general advantages apply to all adolescents interested in company-based training. The analyses of regional disparities, however, requires consideration of complex interaction effects. Eckelt and Schauer (2019) report that individuals without higher education entitlements can benefit from an excess supply of training places if they achieved a graduation certificate in comparison to an adolescent who left school without a school certificate. This is surprising, because it shows that the extent to which school certificates affect the access to VET depend on regional differences. Nevertheless, a more differentiated view of adolescents' characteristics (e.g., grades, migration and parental background) and their interaction with the regional conditions of the training market is necessary and can enhance the current research (Baethge et al., 2016; Kleinert et al., 2018). Additionally, it must be supposed that the advantages for VET-interested adolescents are more pronounced for less attractive occupations when competition for company-based training among adolescents decreases. One indicator of attractiveness is the share of vacancies of training places in an occupation which indicates hiring challenges. Therefore, it is assumed that occupations characterized by hiring challenges are less attractive and provide easier access to company-based training, particularly when competition for company-based training among adolescents decreases.

This contribution seeks to shed more light on these research gaps and investigates the following research questions:

- To what extent do different regional training market conditions affect adolescents' access to company-based training in market-mediated training systems?
- Do those effects interact with adolescents' characteristics?
- Do those effects differ between different clusters of hiring challenges for company-based training programmes?

2 Understanding the Matching Process in the Training Market

Matching in training markets is a complex process and is influenced by several frictions. Following general assumptions of matching function in labour markets companies as well as adolescents have to handle with different information imperfections, like identifying potential training contract partners and their heterogeneities (Petrongolo & Pissarides, 2001). Therefore, the commitment of adolescents and training providers in search and recruiting process is a critical success factor of the matching process (e.g. Diamond, 1982; Mortensen, 1982). This means, both, training providers and adolescents, have to engage and signal the willingness to enter in a training contract. Therefore, access to a training place is seen as a complex interplay of self- (i.e., the adolescent) and external- (i.e., company-based conditions and training-market conditions) selection mechanisms. The major preconditions for a successful training contract are the offer of a training place from a company, a training intention by an adolescent and the acceptance on specific contract agreements by both parties.

In brief, an adolescent's decision to apply for a company-based training place is shaped by individual, institutional, and regional constraints and opportunities (Glauser & Becker, 2016) as well occupational preferences, interests (e.g., Holland, 1997), and outcome expectations (e.g., Lent et al., 1994).[2] If adolescents choose a company-based training place over other available educational options, the success of their application, however, is primarily determined by the training companies.[3]

In general, for marked-mediated training places companies aim to ensure the best possible choice of applicants to fill their training places. Consequently, it is important to ensure that the company training strategy, the training requirements and the personality traits of the applicants (especially their competencies) are a good match. These imperatives are also important for minimizing any issues that may arise between the training seekers and providers during the training process. According to the assumptions of the job competition model (Thurow, 1972, 1975), applicants are ranked (in job queues) by their potential as workers on a scale from best to worst. A training offer is given to those who are expected to fulfil the highest expectations of the company. Therefore, companies use different signals (i.e., changeable attributes proven by school certificates or work references) and indices (i.e., unchangeable attributes, such as gender) as selection criteria for the applicants (Spence, 1973). Even if an adolescent has a relatively short curriculum vitae (CV), a variety of information is already evident in their school certificates, which will be used to estimate their suitability. Schuler et al. (2007) show that it is common to screen application documents for company-based training places. In this regard, school certificates and grades are important (Forsblom et al., 2016).

2 Regarding the development of occupational preferences, an integrated perspective of sociological and psychological theories is required (for an overview, see Brown & Lent, 2013).

3 Obviously, an adolescent can also reject the offer of a training contract. Nevertheless, companies have a more favourable market situation as they can evaluate applications simultaneously, compare applicants and react more easily to unrealised contracts with their preferred candidates.

Studies in Germany show that the higher the applicant's level of education, the more likely it is that they will obtain a training contract (e.g., Autorengruppe Bildungsberichterstattung, 2018; Busse, 2020a, 2020b; Holtmann et al., 2017; Protsch & Dieckhoff, 2011). Additionally, it is well known that better grades favour obtaining a training place (e.g., Beicht & Walden, 2017; Busse, 2020a, 2020b; Holtmann et al., 2017; Protsch & Solga, 2015). From a theoretical point of view, companies' selection practices can partly explain the (re)production of social inequalities as a result of the market-based inclusion mechanism. Numerous studies report social and migration-related disparities in school-leavers' access to company-based training (Seeber et al., 2019a). The influence of social origin on students' access to company-based training can be partially revealed in the resources relevant for the access to VET (human, social and cultural capital); migrants are more likely to have a lower socioeconomic status (SES). Due to effects (the link between social background and school performance, Boudon, 1974), adolescents with low SES, as well as young immigrants, are less likely than adolescents with high SES or non-migrants to be successful in school in general. The label "no or low school-leaving certificates" has been proven to be an obstacle for school-leavers' access to VET (Holtmann et al., 2017; Seeber et al., 2019a). The primary effects of social origin and migrant background also lead to differences in the resources available to applicants for company-based training (Beicht & Walden, 2019). Therefore, it can be assumed that companies are more likely to rank low-SES adolescents and immigrants in lower positions in the application queue.

3 Fostering Disparities due to the Regional Training Market Situation

The regional nature of the training market reflects the complex effects of the contextual mechanisms of the training system. On the one hand, the regional economic structure and performance (industrial and occupational structure, enterprise density, company sizes, etc.) primarily determine the qualitative and quantitative structure of the supply side. On the other hand, the adolescents interested in VET constitute the demand side (influenced in particular by demography, level of education, and training alternatives; Bundesinstitut für Berufsbildung [BiBB], 2018; Seeber et al., 2019b). Regional training market conditions may restrict or improve an individual's opportunity to achieve a training place (Baethge et al., 2016; Busse, 2020b; Eckelt & Schauer, 2019; Weßling et al., 2015). From the perspective of adolescents interested in company-based training, regional competition is a central factor that affects the chance to obtain a training place. Previous studies have already shown that a higher relationship of supply with the demand for training places fosters opportunities for obtaining a company-based training place (Beicht & Walden, 2017; Lex & Zimmermann, 2011). Therefore, it is assumed:

H1: The chances of obtaining a company-based training place increases when there is reduced regional competition for company-based training among adolescents.

Theoretical assumptions regarding application hierarchies continue to apply to training market situations characterized by reduced competition for company-based training among adolescents. In this regard, Eckelt and Schauer (2019) show that advantages exist primarily for better-qualified adolescents. We aim to expand the state of research and consider that obtaining a training place depends on the interactions between educational qualifications and grade point average (GPA).

H2a: Better-qualified adolescents continue to have the highest probability of obtaining a training place if regional competition for company-based training among adolescents decreases.

H2b: If regional competition for company-based training among adolescents decreases, the first to benefit are the better-qualified adolescents with poorer GPAs. Lower-qualified adolescents only benefit if they have a better GPA.

Additionally, we assume that social and migration-related disparities are more pronounced in regional training market conditions characterized by a higher competition for company-based training among adolescents. To our knowledge, existing research provides no evidence for the link between regional training market conditions on the one hand, and social and migration-related disparities in access to VET on the other hand.

H3: Social and migration-related disparities in access to company-based training are more likely to occur in regional training markets with increased competition.

We believe that the advantages of obtaining a training place due to reduced regional competition among VET-interested individuals do not apply to the full range of occupations. From the perspective of market allocation, the most attractive training places are filled when there is insufficient demand. This means that advantages in accessing training places should be more likely for those occupations that are already characterized as having hiring challenges. In previous research, this aspect was not considered. Therefore, we assume:

H4: The advantages of obtaining a company-based training place due to reduced regional competition for company-based training among adolescents matter for occupations that are affected by hiring challenges.

4 Method

4.1 The German Dual System as a Research Object

To verify the hypothesis, we examined the German training market as the object of analysis. In Germany, two full qualification training systems exist. Most full qualification VET programmes can only be completed through the German dual training system (326 training programmes in 2018, [BiBB, 2018]; see [Solga et al., 2014] for an overview of Germany's VET structure). The dual training system is given a high priority as it provides a large proportion of Germany's first-time vocational qualifications; in 2018, for example, 492,668 trainees entered the dual training system (Autorengruppe Bildungsberichterstattung, 2020). The system is called dual because economic as well as public institutions are responsible for the training programmes, with the learning venues shared between companies (e.g. in the private and public sector as well as public administration) and vocational schools. In accord with companies' involvement, access to dual training places is controlled by the training market. Officially, there are no prerequisites for applicant qualification in the dual training system. However, despite this, the dual training system is predominated by trainees with intermediate secondary school certificates (which are intermediate general educational qualifications); for example, entering trainees in 2016 possessed an intermediate secondary school certificate (47.4%); no or a lower secondary school certificate (27.4%); or a university entrance qualification (22.9%) (Autorengruppe Bildungsberichterstattung, 2018). In Germany, there is also a full-time school-based VET system (2018: 215,819 entering trainees [Autorengruppe Bildungsberichterstattung, 2020]). Most training programmes are focused on the public sector (especially for the fields of health, education and social services). The selection of apprentices takes precedence over the examination of their formal requirements, such as school certificates (Michaelis, 2017). Because control mechanisms and access conditions for the full-time school-based VET systems differ from those of the dual training system, the full-time school-based VET system is not considered in this paper.

The relation of supply and demand in the German training market is not balanced. Excess demand for training places existed for years in Germany, but the nation has experienced a trend of decreasing competition between applicants in recent years. For example, in 2012, 100 applicants were faced, on average, with 93.2 training places; in 2017, this increased to 94.8 training places (BIBB, 2013, 2018). These dates are based on official statistics. It should be assumed that the real supply and demand is higher because not every training place and VET-interested adolescent registers at the Federal Labour Office. Nevertheless, regional analyses make it clear that the relationships between supply and demand differ between training market regions (Autorengruppe Bildungsberichterstattung, 2012; BiBB, 2018). Excess demand conditions exist in numerous western German regions while excess supply for trai-

ning places exists mainly in southern regions (Bavaria, Baden-Wuerttemberg) and eastern German federal states. In this regard, some studies show that access to the German dual training system may differ between local training regions (Eckelt & Schauer, 2019; Hillmert et al., 2017). Additionally, event-history analyses even show that regional differences are, thus far, more influential than temporary crises in the German labour market in relation to gaining entry into dual training (Hillmert et al., 2017).

4.2 Data

For the following analyses, the Starting Cohort 4 (SC4, version 10.0.0) of the National Education Panel (NEPS) is used (Blossfeld et al., 2011). This dataset contains 16,425 9th-grade pupils in Germany who were interviewed using a longitudinal study design starting in autumn 2010 (wave 1). Their individual development and educational and employment experiences comprise the subjects of these interviews. The cohort is only partially representative of 9th-grade pupils in Germany. In this dataset, pupils in lower secondary education (23.2% of wave 1), special needs schools (7.2% of wave 1) and comprehensive schools (17.2% of wave 1) are over-represented (Steinhauer & Zinn, 2016). This is advantageous for this contribution. Hence, the chances of lower-educated adolescents entering dual training could be investigated more precisely.[4]

The dataset is limited to graduates and school-leavers from general educational schools who graduated/left after the 9th or 10th grade. This limitation is necessary, as matching problems concerning dual training programmes are more likely in this cohort.

The NEPS dataset includes different aspects of the CV (e.g., school episodes, pre-vocational programmes, vocational and higher education programmes, military enlistments, employment and unemployment, parental leave episodes, internships and gaps). The CV episodes of each study participant are sorted chronologically by their respective start dates. In the dataset, there exists no direct variable with information regarding school-leavers according to the grade level. Thus, the target group has to be determined approximatively. To do this, school-leavers were identified based on their recorded grade level for each wave of the survey as well as the type of school visited at the time. If a NEPS participant left a Hauptschule (lower secondary school), Realschule (secondary school), Haupt- and Realschule (a combined school), Gymnasium (school to obtain a university entrance qualification), comprehensive school, Waldorfschule (common private school in Germany) or special needs school within the first seven waves and obtained no university entrance qualification in a general education programme, the participant was scored as a school-leaver after the 9th and 10th grade. In total, there were 6,561 school-leavers: 5.0% had no educational qualification, 4.9% left with an

4 In relation to the representativeness of the sample, it is important to use a weighting factor for descriptive distributions. Thus, a calibrated cross-sectional weight is used which refers to the representativeness of 9th graders in wave 1.

exam certificate from a special needs school (German: "Sonder- oder Förderschulabschluss"), 22.5% had a regular lower-secondary school certificate (German: "Hauptschulabschluss"), 13.8% had a qualified lower-secondary school certificate, and 53.8% had an intermediate secondary school certificate (German: "mittlerer Bildungsabschluss") (distribution without weighting factor).

4.3 Dependent Variables

The initial entry into the German VET system is considered. A successful dual training applicant is one who achieved a position in a skilled labour training or a dual training programme. Here, all persons are excluded who entered into a full-qualifying school-based VET program or non-company-based training programme or who started a training programme abroad.

The identification of unsuccessful training applicants is not possible in the NEPS dataset. Although there were retrospective interviews to determine whether an NEPS participant applied for a training place, this variable has several problems because it includes missing values, does not contain any information about the application date and includes applications for the full-qualifying school-based VET system. Therefore, for this analysis, NEPS participants are considered to be a reference group that entered into pre-vocational programmes in the transition sector[5] after leaving general school (9th and 10th grade). Due to compulsory schooling regulations in Germany, adolescents enter into these programmes (in most federal states) if they are interested in training but have not received a training place, or in some cases, if they have not fulfilled their compulsory education requirements.

The dependent variable thus measures the initial entry into a dual training place or pre-vocational programme of the previously described sample. All the previously described adaptions reduced the sample size to 4,608 adolescents (dual training sector: 2,874; transition sector: 1,734).

When the months including July to September were used as a starting point for a training year, most trainees started their pre-vocational programme or dual training between summer 2011 and summer 2013 (transition sector: 93.3%, dual training sector: 91.4%).

4.4 Independent Variables

To measure the impact of competition for company-based training among adolescents on entry into dual training, each NEPS participant receives information on the regional (employment agency district level) competition for training places. Therefore, the relationship between the ratio of supply and demand for training places (SDR) for the training year

5 This sector involves a variety of pre-vocational programmes that allow applicants to enhance their competences and gain work experience through internships in order to improve their chances of entering a full-qualifying VET programme (Solga et al., 2014).

2012 is used.[6] In Germany, the SDR is a popular indicator of vocational reporting. It indicates the ratio of dual training opportunities offered (concluded training contracts plus vacant training places) and dual training opportunities requested (concluded training contracts plus vacant adolescents with intentions of obtaining training contracts) in a given training year (BiBB, 2018).

School-leaving certificates are used to differentiate educational achievement after 9th or 10th grade. Three educational qualification categories are distinguished here; the highest qualification level is the "intermediate secondary school certificate" (intermediate educational qualification, in German: "mittlerer Bildungsabschluss"). For low-level educational qualifications, a distinction is made between "no or regular lower-secondary school certificate" (German: "kein Abschluss oder Hauptschulabschluss") and "qualified lower-secondary school certificate" (German: "qualifizierter Hauptschulabschluss")[7]. The former includes adolescents without school certificates, adolescents with a certificate given by a special needs school and adolescents with a regular lower-secondary school certificate (this category is the lowest educational level). The student's GPA is used to obtain differentiated information concerning the quality of said school certificates. In Germany, grades are coded from 1 (very good) to 6 (insufficient).

Three different variables are used to achieve information regarding the effects of social disparities. First, a migration background is considered. Therefore, all participants who were born abroad or had at least one parent born abroad are marked as having a migration background. Second, to control the socioeconomic background, parental education (whether both parents achieved no or a lower-secondary school certificate), as well as parents' maximum value on the International Socio-Economic Index 2008 (ISEI-2008, Ganzeboom, 2010),[8] are considered. Regarding parental maximum ISEI-08 values, a distinction is made between parents who achieved a maximum value of 30 on this scale and parents who achieved a value higher than 30. This threshold has been used because most of the semi-skilled and low-prestige occupations are in the cluster with lower ISEI-08 values.

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6 The matching of the NEPS data set with regional SDR values has been performed by the LifBi (Institution for data repository). However, a clear regional identification of NEPS participants for users of the NEPS dataset is generally prohibited (data protection). This would be violated if both annual and region-specific training market data were merged with the NEPS data set. Therefore, only SDR values of the training year 2012 have been merged with the NEPS data set. As described before this does not fully cover the VET start years. Nevertheless, VET monitoring reveals that developments in the training market over two years are only slight. Thus, it is assumed that the resulting bias is low (see e.g. BiBB, 2018).

7 In many federal states exist an extended version of the "lower-secondary school certificate". Depending on federal state specific school law, there are federal state specific provisions for this certificate (for example, a further school year, additional examinations or a certain grade point average). In NEPS all of these forms are labelled as "qualified lower-secondary school certificate". However, for all variants it has been expected that this qualified school certificate fosters the chance to obtain a dual training place.

8 This is an internationally recognised indicator based on the International Standard Classification of Occupations 2008 (ISCO-08). The ISCO-08 classifies occupations according to skill levels and specifications. On this basis, the ISEI-08 calculates a prestige value that considers the expected level of education and future income of an occupation (Ganzeboom, 2010; Ganzeboom et al., 1992). This Index varies between 11.01 and 88.96.

4.5 Control Variables

The NEPS dataset provides information about the basic cognitive dispositions of said adolescents to obtain a differentiated insight into the abilities of the adolescents in this study. The scales of the Domain General Cognitive Functions (DGFC) are considered (Haberkorn & Pohl, 2013); the DGFC distinguishes between the dimensions of "reasoning" and "perceptual speed". For ease of interpretation, the DGFC scales were normalised to a mean of 0, with a standard deviation of 1. To control the more sophisticated abilities of school-leavers, grades in mathematics and German for the last interim report before entering in VET were also used. Another control variable is the gender variable (reference category: Male adolescents).

Due to the federalism of Germany's educational systems and the fact that educational systems differ between federal states, as well as specific context factors for federal states (economy, demography, etc.), the influence of federal states is controlled in all models. Therefore, dummy variables for the place of school at the level of the federal states are built (15 dummy variables, 1 federal state as reference). However, the data usage contract prohibits the identification of federal state-specific effects. Thus, these effects cannot be reported.

4.6 Distribution of Independent and Control Variables

Table 1 includes information about the distribution of independent and control variables (mean/standard deviation).

Table 1: Distribution of Independent and Control Variables (Mean/Standard Deviation)

	Total sample	**Dual training**	**Transition sector**
Independent variables			
SDR	93.901 / 7.094	94.828 / 7.227	92.023 / 6.420
Qualified lower secondary school certificate	.128 / .334	.119 / .324	.146 / .353
No or regular lower-secondary school certificate	.287 / .452	.175 / .380	.517 / .500
GPA	2.708 / .561	2.632 / .524	2.880 / .605
Migration background	.249 / .432	.210 / .407	.331 / .471
Both parents have no or lower secondary school certificate	.120 / .325	.120 / .325	.119 / .324
Max. parental ISEI < 30	.159 / .365	.148 / .355	.181 / .384
Control variables			
Grade in mathematics	3.061 / .926	2.963 / .919	3.28 / .904
Grade in German	2.945 / .770	2.903 / .757	3.04 / .792
Perceptual speed (DGFC)	.033 / .975	.067 / .960	-.042 / 1.00
Reasoning (DGFC)	.128 / .966	.245 / .914	-.126 / 1.03
Sex (female)	.396 / .489	.371 / .483	.446 / .497

Note. Weighted but not imputed data.

4.7 Analysis Strategy

Logistic regressions are used to analyse the initial entry into a dual training place against the initial entry into the transition sector of 9th and 10th-grade school-leavers. A binomial logistic regression analysis is built up stepwise to verify the hypotheses H1 to H3. In the first model, only the influence of the regional situation of the training market (SDR) is examined beside the control variables (M1). The next models (M2) examined a more sophisticated influence of all independent variables (M2) and the interactions of those with the SDR (M3 and M4).

To verify hypothesis H4, all dual training programmes are clustered towards their value of vacant training places to all offered dual training places in Germany for the year 2012.[9] [10] This value indicates the extent of the hiring challenges for an occupational group. The entered dual training programmes in the data set varies between .5 and 24.2% of vacant training places (median = 4.3%, standard deviation = 5.1%). Dual training starters are clustered in three comparable quantitative clusters: (1.) Low hiring challenges (vacant training places <= 2.5%, ca. 33.6% of dual training starters), intermediate hiring challenges (2.5% < vacant training places <= 5.0%, ca. 32.1% of dual training starters), higher hiring challenges (vacant training places > 5%, ca. 34.3% of dual training starters). A multinomial logistic regression is used to prove the influence of the predictors in achieving a training place in one of those groups with different hiring challenges. For a better interpretation of these regression results, potential future outcomes of relating occupations in the hiring challenge differentiated clusters are viewed. In NEPS, each occupation is assigned an ISEI-08 value. As explained above (section 4.4), this is a prestige value that considers the expected level of education and future income of an occupation (Ganzeboom, 2010; Ganzeboom et al., 1992). Thus, in the last step, relating ISEI-08 values of the hiring challenge differentiated clusters are compared.

Interaction terms with metric variables serve the risk to increase multicollinearity. A practical approach is to centre the metric variables of the interaction terms on the mean (Jaccard et al., 2003). Thus, centring on the mean is done for the GPA (mean = 2.71, SD = .56) and SDR (mean = 93.60, SD = 6.96).

For the model output, the average marginal effects (AMEs) are presented. The AME indicates the average change (of all group-specific observations), in percentage points, of a predictor on the probability of the occurrence of an event (e.g., entry into the dual training system) if the predictor increases by one unit.

9 Due to data availability this clustering is made on higher occupational aggregation, the 3-digital level of the KldB 2010. Therefore, 95 occupational groups could be distinguished in the NEPS data set. The KldB 2010 (German: "Klassifikation der Berufe 2010") is the standard occupational classification system in Germany (Paulus & Matthes, 2013).

10 In the case of missing in official data, the values of 2013 are used.

However, interaction terms are difficult to interpret. Therefore, the influence of selected (significant) interactions on the predicted probability of obtaining a dual training place is visualized.

Missing values were estimated by multiple imputation (n = 10). A multivariate imputation by chained equations is used. To predict the missing values, all the variables included in the regression model, as well as individual competence values (in mathematics, reading, science and ICT-literacy), are used as predictors.

5 Results

Table 2 presents the results of a stepwise binomial logistic regression, which are used to explain the initial entry of 9th and 10th-grade school-leavers into dual training places.

Table 2: Binomial Logistic Regression to Explain the Initial Entry of 9th and 10th-Grade School-Leavers Into Dual Training Places

Model	(M1) Regional SDR	(M2) + educational attainment & social disparities	(M3) + interaction terms	(M4) + differentiated educational interaction
Regional training market condition				
SDR	.0061***	.0043**	.0076**	.0076**
Educational qualification (reference category for the school certificate: intermediate secondary school certificate) and GPA				
Qualified lower secondary school certificate		-0.1791***	-0.1839***	-0.1848***
No or regular lower secondary school certificate		-0.3766***	-0.3803***	-0.3810***
GPA		-.0601**	-.0574**	-0.1025***
Social background characteristics				
Migration background		-.0671***	-.0676***	-.0687***
Both parents have no or lower secondary school certificate		.0153	.0200	.0205
Max. parental ISEI < 30		-.0250	-.0241	-.0253
Interaction terms				
Qualified lower secondary school certificate * GPA				.0859*
No or regular lower secondary school certificate * GPA				.0604*

Qualified lower secondary school certificate * SDR			-.0026	-.0025
No or regular lower secondary school certificate * SDR			-.0066**	-.0065**
GPA * SDR			.0043*	.0074*
Qualified lower secondary school certificate * GPA * SDR				-.0092^
Maximum regular lower school certificate * GPA * SDR				-.0033
Migration background * SDR			-.0008	-.0006
Both parents have no or lower secondary school certificate * SDR			.0058^	.0055^
Max. parental ISEI < 30 * SDR			-.0012	-.0013
Control variables				
Perceptual speed (DGFC)	.0250**	.0120^	.0122^	.0123^
Reasoning (DGFC)	.0750***	.0170*	.0177*	.0179*
Grade in mathematics	-.0430***	-.0314***	-.0315***	-.0301**
Grade in German	-.0457***	.0020	.0021	.0012
Sex (female)	-.0812***	-.0755***	-.0774***	-.0793***
Control for federal states	x	x	x	x
Pseudo R^2	.105	.233	.236	.238

Note. Reference group: Initial entry into transition sector; significance levels: The significance levels refer to the AME coefficients: p *** < .001, ** < .01, * < .05, ^ < .1; unweighted but imputed data.

M1 shows that the chances of obtaining a training place in the dual system increased with lower regional competition for company-based training among adolescents. For each higher percentage point in the SDR, the average probability of obtaining a dual training place increases by approximately 0.6 percentage points, ceteris paribus.

M2 makes it clear that low-educational qualification, a poorer GPA, and migration background substantially limited the probability of achieving a dual training place.

In M3, it can be seen that the positive influence of the SDR on obtaining a dual training place is also valid when an interaction of SDR and the educational qualification category is generated. In terms of interaction, however, only the interaction term between SDR and the lowest educational qualification category (no or regular lower secondary school certificate) is significant. The associated AME is negative. This means that the probability function of adolescents with no or regular lower secondary school certificates has a lower slope in

comparison to adolescents with an intermediate secondary school certificate when SDR is increasing. Therefore, Figure 1 illustrates the interaction effect of educational qualification categories and SDR in obtaining a dual training place.

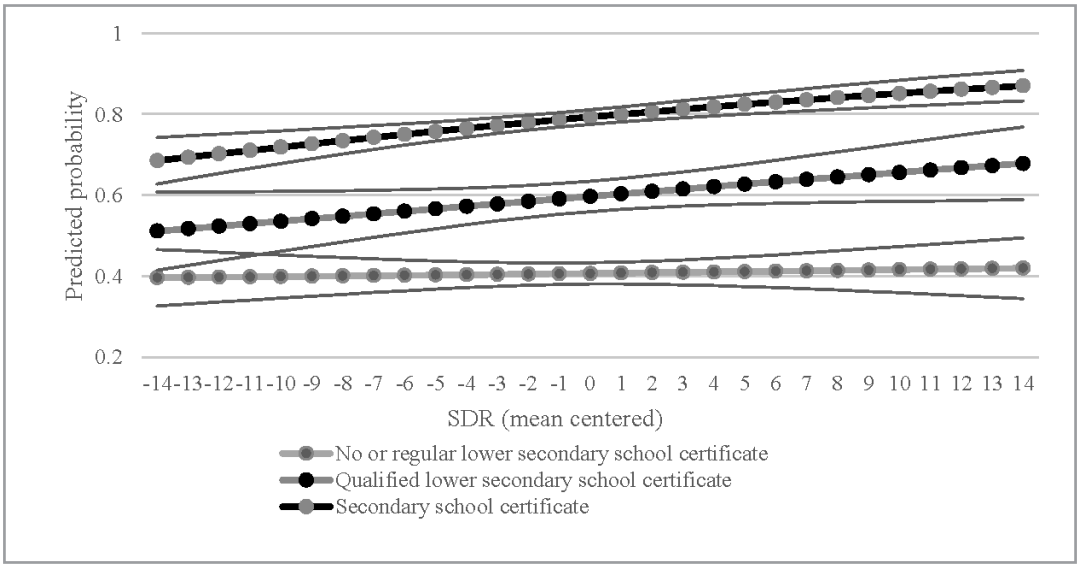


Figure 1: Predicted Probabilities to Obtain a Dual Training Place for the Interaction Terms of Educational Qualification Categories and SDR

Note. Based on the regression model M3; due to the centring of the SDR, no real SDR values can be printed. The 0.0 represent approximately the SDR mean in the non-imputed data set (SDR = 93.60%); confidence intervals as grey lines.

Considering only the interaction between GPA and SDR (M3), a significant positive interaction term is evident, meaning that the probability of obtaining a dual training place for school-leavers with higher GPAs increases when SDR increases. Figure 2 illustrates this interaction.

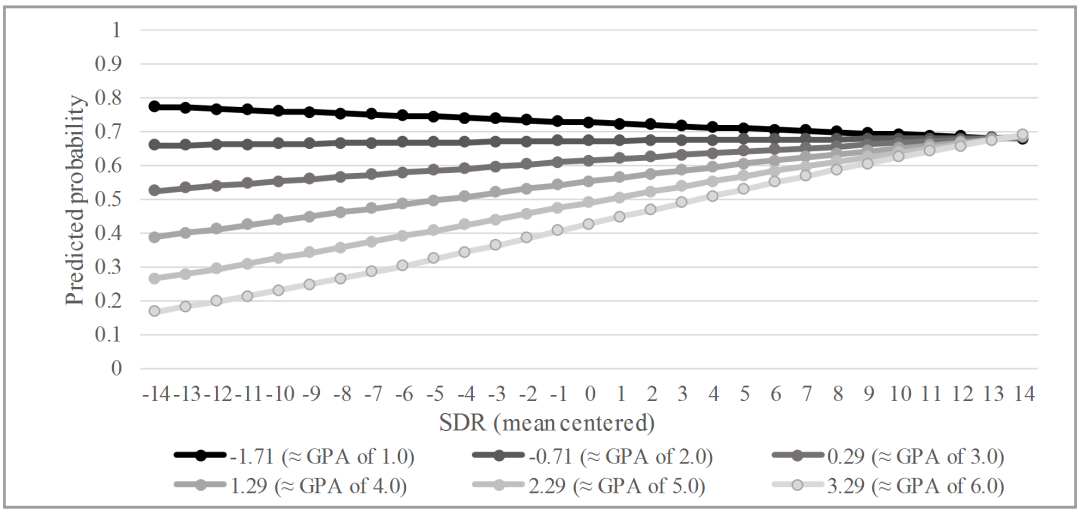


Figure 2: Predicted Probabilities to Obtain a Dual Training Place for the Interaction of GPA and SDR

Note. Based on the regression model M3; due to the centring of the GPA and SDR, no clear grade levels and no real SDR values can be printed; an SDR of 0.0 represents approximately the SDR mean in the non-imputed data set (SDR = 93.60%); for better legibility without confidence intervals.

M4 extended the previous perspective by an interaction of SDR, educational qualification category and GPA. The interpretation of all interaction terms has to be done with caution because not every term considered in this interaction is significant. For an easier interpretation, Figure 3 visualizes these interaction terms. Here, it becomes clear that adolescents with intermediate secondary school certificates and poorer GPAs (higher GPA value), as well as adolescents with qualified lower secondary school certificates and lower GPAs, benefit by an increase in the SDR. Additionally, adolescents with no or maximum regular lower secondary school certificates could also benefit from an increase in the SDR if they have a poorer GPA. However, Figure 3 reveals that the predicted probability of those adolescents does not reach the predicted probabilities of adolescents with higher school certificates in obtaining a dual training place over most SDR values.

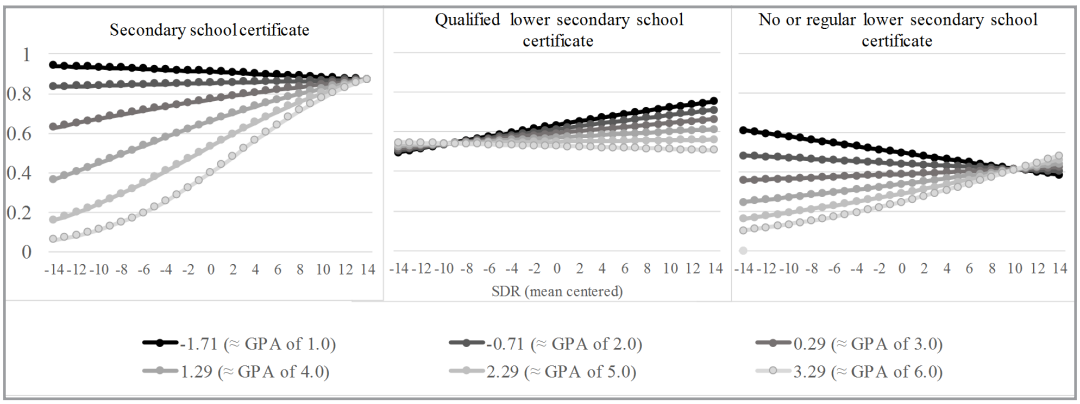


Figure 3: Predicted Probabilities of Obtaining a Dual Training Place for the Interaction of Educational Qualification Categories, GPA and SDR

Note. Based on the regression model M3; due to the centring of the SDR, no real SDR values can be printed. The 0.0 represent approximately the SDR mean in the non-imputed data set (SDR = 93.60%); for better legibility without confidence intervals.

Regarding the influence of social disparities, two significant effects exist in the regression analysis. First, there is a general significant discrimination effect for adolescents with a migration background. For this group, the probability of obtaining a dual training place is on average 6.7 percentage points lower than for adolescents without a migration background, ceteris paribus (based on M2). However, the interaction between SDR and a migration background is not significant. Thus, the benefits of a lower SDR have an equal impact on adolescents with a migration background in comparison to those without a migration background. Figure 4 illustrates this effect. Second, a significant interaction term between SDR and the variable, whether both parents achieve no or a lower secondary educational school certificate is measurable. This effect is positive, which means that the slope of predictive probabilities depending on SDR for this group is higher than for adolescents whose parents achieved higher school certificates. However, the relating significance level is only weak (< 10%) and should be interpreted with caution. For parental ISEI-08, no effects are evident.

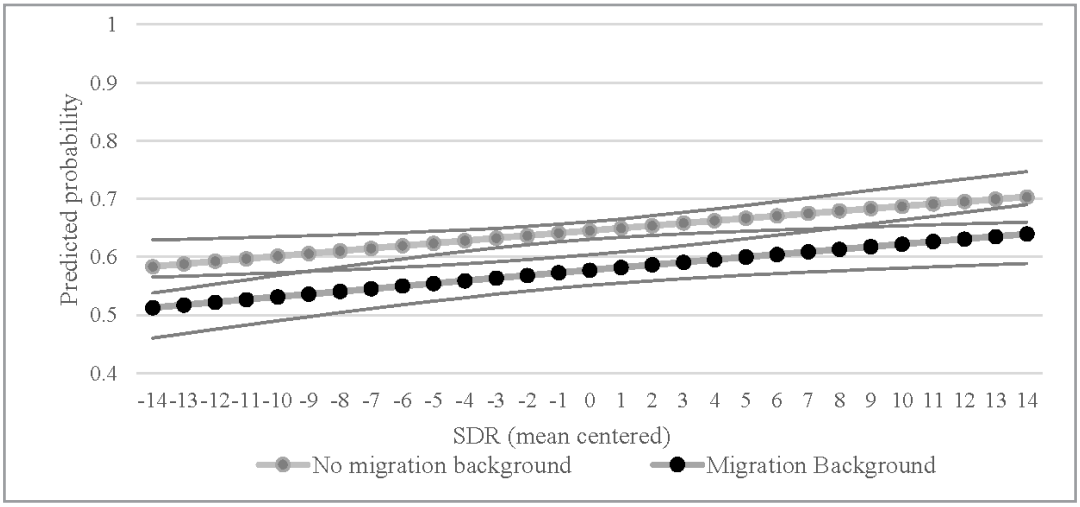


Figure 4: Predicted Probabilities to Obtain a Dual Training Place Depending on Migration Background

Note. Based on the regression model M3; due to the centring of the SDR, no real SDR values can be printed. The 0.0 represent approximately the SDR mean in the non-imputed data set (SDR = 93.60%); confidence intervals as grey lines.

To prove H4, Table 3 shows the results of the multinomial logistic regression. The results make it clear that any advantages in obtaining a dual training place due to increasing SDR is significant and apparent for occupations that are characterized by a share of more than 5% of vacant training places.

Table 3: Multinomial Logistic Regression to Explain the Initial Entry of 9th and 10th-Grade School-Leavers Into Dual Training Places for Different Clusters of Hiring Challenges in Training Occupations

Model	**Low hiring challenges (share of vacant training places <= 2.5%)**	**Intermediate hiring challenges (2.5% < share of vacant training places <= 5.0%)**	**Higher hiring challenges (share of vacant training places > 5%)**
Regional training market condition			
SDR	-.0014	.0033	.0055*
Educational qualification (reference category for the school certificate: intermediate secondary school certificate) and GPA			
Qualified lower secondary school certificate	-0.1263***	-.0484**	-.0005
No or regular lower secondary school certificate	-0.2194***	-.0986***	-.0596***
GPA	-.0930***	.0040	.0296^
Social background characteristics			
Migration background	-.0368**	-.0125	-.0184

Both parents have no or lower secondary school certificate	-.0159*	.0187	.0171
Max. Parental ISEI < 30	-.0259^	.0016	-.0009
Interaction terms			
Qualified lower secondary school certificate * SDR	-.0028	.0028	-.0023
No or regular lower secondary school certificate * SDR	-.0020	.0020	-.0061**
GPA * SDR	-.0001	.0013	.0030^
Migration background * SDR	.0002	-.0020	.0010
Both parents have no or lower secondary school certificate * SDR	.0061	-.0018	.0017
Max. parental ISEI < 30 * SDR	.0016	.0004	-.0032
Control variables			
Perceptual speed (DGFC)	.0025	.0021	.0081
Reasoning (DGFC)	.0142*	.0110^	-.0070
Grade in mathematics	-.0317***	-.0118	.0125
Grade in German	.0137	-.0062	-.0062
Sex (female)	-.0828***	-.0718***	.0754***
Control for federal states	x	x	x
Pseudo R^2	.071		

Note. Reference group: Initial entry into transition sector; Significance levels: The significance levels refer to the AME coefficients: p *** < .001, ** < .01, * < .05, ^ < .1; unweighted but imputed data.

ISEI-08 values for the clusters with low und intermediate hiring challenges differ significantly with the cluster with higher hiring challenges (evaluated by comparison of means, both tests are significant on $p < .001$). For a more straightforward interpretation of this effect, Figure 5 includes box plots that compare the corresponding ISEI-08 values of the hiring challenge clusters in the dataset. It becomes clear that adolescents in occupations with more than 5 percent of vacant training places have remarkably lower ISEI-08 values. Considering the results of Table 3, this indicates that easier entry conditions for dual training places due to a lower SDR apply primarily for low-prestige occupations.

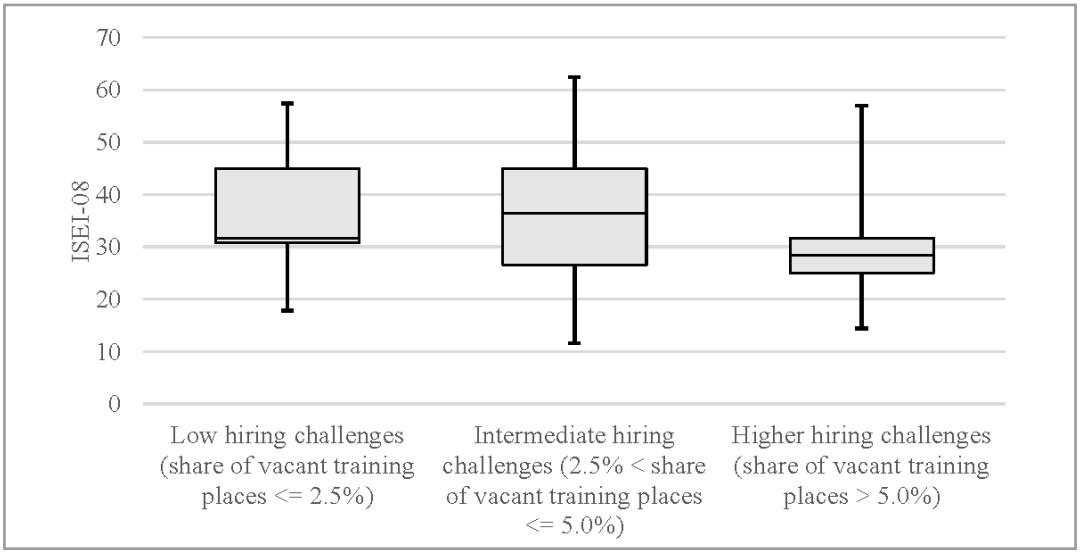


Figure 5: Box Plot to Visualize Distributions of ISEI-08 Values in Hiring Challenge Clusters

Note. Due to outlier, the upper whisker is reduced to a maximum of 97.5% of the ISEI-08 distribution range.

6 Discussion

The analyses make it clear that the chances of obtaining a dual training place differ between regional training markets and increase in competitive training markets with less demand. This is in line with H1 and with previous research results (Beicht & Walden, 2018; Lex & Zimmermann, 2011). Nevertheless, the results reveal that the influence of the regional training market condition becomes more apparent if the interactions with individual characteristics of adolescents are modelled. In particular, beneficiaries are better-qualified adolescents. First, adolescents with an intermediate educational qualification (intermediate secondary school certificate) have the highest chances of obtaining a training contract in the dual system, even if competition for company-based training among adolescents has decreased. Second, the AME of adolescents in the lowest educational category (no or regular lower secondary school certificate) is significantly lower than for adolescents with an intermediate educational qualification (intermediate secondary school certificate) in regard to obtaining a dual training place if competition for company-based training among adolescents decreased. This result is consistent with H2a.

The results in this article also allow for a more differentiated view in comparison to previous research findings of the effects of regional differences in the training market. The interaction of grades and the regional competitive situation in the training market is especially remarkable. If the predictive probability of obtaining a dual training place is plotted according

to GPA levels and SDR for each educational qualification category (Figures 3) two effects become apparent. Adolescents with poor GPAs and intermediate educational qualifications, in particular, benefit the most from decreased competition for company-based training among adolescents, which is in line with H2b. For low-qualified adolescents, it depends on their educational qualification category. The results for adolescents with no or regular lower secondary school certificates show only enhanced opportunities, even in cases where they have poorer GPAs. Nevertheless, their probability of obtaining a dual training place generally remains under the level of both higher-level educational qualification categories. In sum, the overall results show that applicant hierarchies (Thurow, 1972, 1975) are intact even in the case of lower competition for company-based training among adolescents. This also means that the integration of low-qualified adolescents into company-based training will rarely improve if competition for company-based training among adolescents decreases.

Different situations in the training market do not seem to influence the degree of social disparities in accessing company-based training. In other words, when the competition for training places is low, the likelihood of entering company-based training increases to the same extent for both those who are more likely to face disparities in VET access (adolescents of low-SES or with migration background) and for those who are not (adolescents of higher SES or no migration background). Thus, the findings cannot support H3. Contrarily, the results show little evidence for H3, as it applies to parental education. When training competition for training places is low, the likelihood of company-based training access increases to a greater extent for adolescents whose parents were low-educated than for adolescents whose parents were highly educated. It seems that the well-known disadvantages of low parental education in access to VET (Seeber et al., 2019a) do not exist when competition for training is low.

However, the analyses also illustrate that advantages in obtaining a dual training place when lower competition for company-based training among adolescents arise especially in occupations that are characterized by hiring challenges (confirmation of H4). Relating the ISEI-08 values of those occupations indicates that those occupations characterized by low prestige (against the background of the expected level of education and future income of those occupations). This result is noteworthy because it shows that easier access to training places due to relaxing market conditions should not always be interpreted as a gain in regards to opportunity. Without participation in further training, trainees influenced by those advantages could be affected in their future career path with lower monetary outcomes as well as social participation. However, this hypothesis requires further research.

Some further effects are remarkable in the order of the results of different clusters of hiring challenges in training occupations. Regarding the access to lower-prestige occupations (training occupations with intermediate and higher hiring challenges), the migration effect is not significant. This is noteworthy because this result indicates that an occupationally

based segmentation effect exists for young migrants in company-based training. Therefore, an occupational-based analysis of migration effects needs further engagement by research.

In addition, this study did not control for adolescents' educational and occupational choices. Adolescents (and their parents) likely consider the regional opportunity structures in regard to deciding whether to apply for a training place (Glauser & Becker, 2016). Therefore, further research is necessary on the links between the educational and occupational choices of adolescents on the one hand, and regional disparities in company-based training access on the other. Additionally, the influence of market-induced ease-of-access in regards to training offers on actual training success, labour market assessments, as well as career development, have received little attention in research. Regarding the effects of this study, less-demand competitive training markets could foster mismatches and therefore, frictions in the training process as well as influencing career development.

We assume that our results allow international implications. Regional differences in economic and demographic factors as well as limited geographical mobility of adolescents do not only exist in Germany but also in other countries. Therefore, it would be promising for further international research on the access to VET to additionally account for regional training market conditions.

Moreover, the results are important for the understanding of developments of the training market. Trends such as technological and sustainability transformation, structural-economical change or global crisis like the COVID-19-Pandemic can change the supply for as well as the demand for training places. On the one hand these trends and challenges lead to changing qualification profiles and competences that are required of applicants. On the other hand, adolescents' expectations of VET can change. In this vein, training systems are facing increasing pressure: In many countries within the OECD, a clear change in educational structures is visible (for example higher rates of tertiary education) (Musset & Kurekova, 2018; OECD, 2014). As higher education and VET compete for potential demanders (Powell & Solga 2010), the trend towards higher qualification can limit the demand for training places, especially in countries with strong VET traditions. By decreasing the demand for company-based training places this development may lead to an excess supply of training places and, thus, intensify the (regional) competition in the hiring of qualified trainees. However, in the long term, this trend may also force more significant changes in the recruitment strategies of companies, which is an additional future research objective.

Furthermore, educational policies for enhancing matching quality should be tailored to prevent developments of the training market. For example, programs that enhance the geographical mobility may be promising for those adolescents in training markets with excess demand for training places. Another point concerns potential consequences of the training process by a downgrading of hiring standards, because low-skilled adolescents have the highest risk of a premature contract termination (Beicht & Ulrich, 2009; Rohrbach-Schmidt &

Uhly, 2015). Therefore, strategies to promote the quality of training and professionalism of personnel for in-company vocational training should be critically reflected. Furthermore, in order to secure demand for skilled labour in the long term, strategies should be considered to increase the attractiveness of VET.

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References

Autorengruppe Bildungsberichterstattung. (2012). *Bildung in Deutschland 2012. Ein indikatorengestützter Bericht mit einer Analyse zur kulturellen Bildung im Lebenslauf* [Education in Germany 2012: An indicator-based report including an analysis of arts education throughout the life course]. Bertelsmann.

Autorengruppe Bildungsberichterstattung. (2018). *Bildung in Deutschland 2018. Ein indikatorengestützter Bericht mit einer Analyse zu Wirkungen und Erträgen von Bildung* [Education in Germany 2018: An indicator-based report with an analysis on the effects and returns of education]. Bertelsmann. https://doi.org/10.3278/6001820fw

Autorengruppe Bildungsberichterstattung. (2020). *Bildung in Deutschland 2020. Ein indikatorengestützter Bericht mit einer Analyse zu Bildung in einer digitalisierten Welt* [Education in Germany 2020: An indicator-based report with an analysis on education in a digitalized world]. Bertelsmann. https://doi.org/10.3278/6001820gw

Baethge, M., Achtenhagen, F., Arends, L., Babic, E., Baethge-Kinsky, V., & Weber, S. (2006). *PISA-VET. A Feasibility-study*. Franz Steiner.

Baethge, M., Maaz, K., Seeber, S., Jäger, D., Kühne, S., Lenz, B., Michaelis, C., Wieck, M., & Wurster, S. (2016). *Ländermonitor berufliche Bildung 2015: Chancengerechtigkeit und Leistungsfähigkeit im Vergleich der Bundesländer* [Vocational Training Report 2015: Economic performance and social equality of opportunities of the vocational training system at federal state level]. Bertelsmann Stiftung.

Beicht, U., & Ulrich, J. G. (2009). The course of training and the transition to employment. A comparison of participants in in-company and school-based vocational training. *Berufsbildung in Wissenschaft und Praxis* (BWP), special edition, 27–31. https://www.bibb.de/dokumente_archiv/pdf/a12bwp_special-edition_2009_beicht_ulrich.pdf

Beicht, U., & Walden, G. (2017). Transitions of young migrants to initial vocational education and training in Germany: The significance of social origin and gender. *Journal of Vocational Education & Training*, *69*(3), 424–449. https://doi.org/10.1080/13636820.2016.1275032

Beicht, U., & Walden, G. (2018). Neue Bildungsexpansion und Verdrängungseffekte in der betrieblichen Ausbildung [New educational expansion and crowding-out effects in company based training]. *Sozialer Fortschritt*, *67*, 141–172. https://doi.org/10.3790/sfo.67.3.141

Beicht, U., & Walden, G. (2019). Transition to company-based vocational training in Germany by young people from a migrant background – The influence of region of origin and generation status. *International Journal for Research in Vocational Education and Training*, *6*(1), 20–45. https://doi.org/10.13152/IJRVET.6.1.2

Blossfeld, H.-P., Roßbach, H.-G., & von Maurice, J. (2011). Education as a lifelong process – The German National Educational Panel Study (NEPS). *Zeitschrift für Erziehungswissenschaft*, special issue, 14. https://doi.org/10.1007/978-3-658-23162-0

Borjas, G. J. (2013). *Labor economics*. McGraw-Hill/Irwin.

Boudon, R. (1974). *Education, Opportunity, and Social Inequality*. Wiley.

Brown, S. D., & Lent, R. W. (2013). *Career development and counseling: Putting theory and research to work* (2nd ed.). Wiley.

Bundesinstitut für Berufsbildung. (2013). *Datenreport zum Berufsbildungsbericht 2013: Informationen und Analysen zur Entwicklung der beruflichen Bildung* [Data report on the 2013 report on vocational education and training: Information and analyses on the development of vocational education and training]. Bertelsmann.

Bundesinstitut für Berufsbildung. (2018). *Datenreport zum Berufsbildungsbericht 2018: Informationen und Analysen zur Entwicklung der beruflichen Bildung* [Data report on the 2018 report on vocational education and training: Information and analyses on the development of vocational education and training]. Budrich.

Busse, R. (2020a). Der Einfluss persönlicher, sozialer, institutioneller und regionaler Bedingungen auf den Bildungsverlauf von Schulabgängerinnen und -abgängern ohne Studienberechtigung [The influence of personal, social, institutional and regional factors on the educational pathways of school leavers without university entrance certificate: Analyses based on the German National Educational Panel Study (NEPS)]. *Zeitschrift für Berufs- und Wirtschaftspädagogik*, 116(1), 26–56. https://doi.org/10.25162/zbw-2020-0002

Busse, R. (2020b). *Übergangsverläufe am Ende der Sekundarstufe I: Erklärungsansätze für soziale und migrationsbezogene Ungleichheiten* [Educational trajectories after secondary school: Explaining social and migration-related inequalities]. wbv. https://doi.org/10.3278/6004818w

Diamond, P. A. (1982). Wage determination and efficiency in search equilibrium. *The Review of Economic Studies*, *49*(2), 217–227. https://doi.org/10.2307/2297271

Eckelt, M., & Schauer, J. (2019). Der Einfluss des regionalen Ausbildungsangebots auf die Übergangswahrscheinlichkeit in Ausbildung nicht-studienberechtigter Jugendlicher [The influence of the regional supply of training positions on the transition to vocational education and training for school leavers without university entrance certificate]. *Zeitschrift für Berufs-und Wirtschaftspädagogik*, *115*(3), 447–485. https://doi.org/10.25162/zbw-2019-0019

European Centre for the Development of Vocational Training. (2013). *Labour market outcomes of vocational education in Europe: Evidence from the European Union labour force survey*. Publications Office of the European Union. https://doi.org/10.2801/44683

European Centre for the Development of Vocational Training. (2018). *Apprenticeship schemes in European countries: A cross-nation overview*. Publications Office. https://doi.org/10.2801/722857

European Commission. (2012). *Apprenticeship supply in the Member States of the European Union*. Publications Office of the European Union.

Forsblom, L., Negrini, L., Gurtner, J. L., & Schumann, S. (2016). Dropouts in Swiss vocational education and the effect of training companies' trainee selection methods. *Journal of Vocational Education & Training*, *68*(4), 399–415. https://doi.org/10.1080/13636820.2016.1222596

Ganzeboom, H. B. (2010). A new international sozio-economic Index (ISEI) of occupational Status for the international standard classification of occupation 2008 (ISCO-08) constructed with data from the ISSP 2002–2007: With an analysis of quality of occupational measurement in ISSP. *Annual Conference of International Social Survey Programme*. http://www.harryganzeboom.nl/Pdf/2010%20-%20Ganzeboom-ISEI08-ISSP-Lisbon-(paper).pdf

Ganzeboom, H. B., de Graaf, P. M., & Treiman, D. J. (1992). A standard international socio-economic index of occupational status. *Social Science Research*, *21*(1), 1–56. https://doi.org/10.1016/0049-089X(92)90017-B

Glauser, D., & Becker, R. (2016). VET or general education? Effects of regional opportunity structures on educational attainment in German-speaking Switzerland. *Empirical Research in Vocational Education and Training*, *8*(1), 1–25. https://doi.org/10.1186/s40461-016-0033-0

Goastellec, G., & Ruiz, G. (2015). Finding an apprenticeship: Hidden curriculum and social consequences. *Frontiers in Psychology*, *6*(1441), 1–13. https://doi.org/10.3389/fpsyg.2015.01441

Haberkorn, K., & Pohl, S. (2013). *Cognitive basic skills – Data in the scientific use file*. https://www.neps-data.de/Portals/0/NEPS/Datenzentrum/Forschungsdaten/SC3/com_cogbasic2013_en.pdf

Hillmert, S., Hartung, A., & Weßling, K. (2017). A decomposition of local labour-market conditions and their relevance for inequalities in transitions to vocational training. *European Sociological Review*, *33*(4), 534–550. https://doi.org/10.1093/esr/jcx057

Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments (3rd ed.)*. Psychological Assessment Resources.

Holtmann, A. C., Menze, L., & Solga, H. (2017). Persistent disadvantages or new opportunities? The role of agency and structural constraints for low-achieving adolescents' school-to-work transitions. *Journal of Youth and Adolescence*, *46*(10), 2091–2113. https://doi.org/10.1007/s10964-017-0719-z

Jaccard, J., Turrisi, R., & Jaccard, J. (2003). *Interaction effects in multiple regression (2nd ed)*. Sage University Papers Series on Quantitative Applications in the Social Sciences. Sage. https://doi.org/10.4135/9781412984522

Kleinert, C., Vosseler, A., & Blien, U. (2018). Classifying vocational training markets. *The Annals of Regional Science*, *61*(1), 31–48. https://doi.org/10.1007/s00168-017-0856-z

Lent, R. W., Brown, S. D., & Hackett, G. (1994). Toward a unifying social cognitive theory of career and academic interest, choice, and performance. *Journal of Vocational Behavior*, *45*, 79–122. https://doi.org/10.1006/jvbe.1994.1027

Lex, T., & Zimmermann, J. (2011). Wege in Ausbildung [Pathways into vocational training]. *Zeitschrift für Erziehungswissenschaft*, *14*(4), 603–627. https://doi.org/10.1007/s11618-011-0250-z

Michaelis, C. (2017). Zur Steuerung und Entwicklung des Schulberufssystems unter Berücksichtigung rechtlicher sowie ausbildungsmarktabhängiger Einflüsse [Operation and development of the school-based VET system, taking into account legal and training market influences]. *Recht der Jugend und des Bildungswesens*, *65*(4), 406–424. https://doi.org/10.5771/0034-1312-2017-4-406

Mortensen, D. T. (1982). The matching process as a non-cooperative/bargaining game. In J. J. McGall (Ed.), *The economics of information and uncertainty* (pp. 233–258). University of Chicago Press.

Musset, P., & Kurekova, L. M. (2018). *Working it out: Career guidance and employer engagement*. OECD Publishing. https://doi.org/10.1787/51c9d18d-en

Organisation for Economic Co-operation and Development. (2010). *Learning for jobs*. OECD. https://doi.org/10.1787/9789264087460-en

Organisation for Economic Co-operation and Development. (2014). *Education at a glance OECD indicator*. OECD Publishing. https://doi.org/10.1787/eag-2014-en

Paulus, W., & Matthes, B. (2013). *Klassifikation der Berufe: Struktur, Codierung und Umsteigeschlüssel* [Classification of occupations: structure, coding and conversion key]. Bundesagentur für Arbeit. http://213.241.152.197/fdz/reporte/2013/MR_08-13.pdf

Petrongolo, B., & Pissarides, C. A. (2001). Looking into the black box: A survey of the matching function. *Journal of Economic Literature*, *39*(2), 390–431. https://doi.org/10.1257/jel.39.2.390.

Poulsen, S. B., & Eberhardt, C. (2016). *Approaching apprenticeship systems from a European perspective*. BiBB.

Powell, J. J., & Solga, H. (2010). Analyzing the nexus of higher education and vocational training in Europe: A comparative-institutional framework. *Studies in Higher Education*, *35*(6), 705–721. https://doi.org/10.1080/03075070903295829

Protsch, P., & Dieckhoff, M. (2011). What matters in the transition from school to vocational training in Germany: Educational credentials, cognitive abilities or personality? *European Societies*, *13*(1), 69–91. https://doi.org/10.1080/14616696.2010.540352

Protsch, P., & Solga, H. (2015). How employers use signals of cognitive and noncognitive skills at labour market entry: Insights from field experiments. *European Sociological Review*, *31*(5), 521–532. https://doi.org/10.1093/esr/jcv056

Rohrbach-Schmidt, D., & Uhly, A. (2016). Betriebliches Vertragslösungsgeschehen in der dualen Berufsausbildung. Eine Analyse des BIBB-Betriebspanels zu Qualifizierung und Kompetenzentwicklung [Company contract termination in dual vocational education and training. An Analysis of the BIBB Company Panel on Qualification and Competence Development]. *Empirische Pädagogik*, *30*, 372–401.

Schuler, H., Hell, B., Trapmann, S., Schaar, H., & Boramir, I. (2007). Die Nutzung psychologischer Verfahren der externen Personalauswahl in deutschen Unternehmen: Ein Vergleich über 20 Jahre [Use of personnel selection instruments in German organizations in the last 20 years]. *Zeitschrift für Personalpsychologie*, *6*(2), 60–70. https://doi.org/10.1026/1617-6391.6.2.60

Seeber, S., Busse, R., Michaelis, C., & Baethge, M. (2019a). Migration in der beruflichen Bildung: Herausforderungen für die Integration von zugewanderten schutz- und asylsuchenden Jugendlichen [Migration in vocational eduation and training: Challenges of the integration of asylum seekers and refugees]. *Zeitschrift für Erziehungswissenschaft*, *22*, 71–99. https://doi.org/10.1007/s11618-019-00890-4

Seeber, S., Wieck, M., Baethge-Kinsky, V., Boschke, V., Michaelis, C., Busse, R., & Geiser, P. (2019b). *Ländermonitor berufliche Bildung 2019: Ein Vergleich der Bundesländer mit vertiefender Analyse zu Passungsproblemen im dualen System* [Vocational training report 2019: In-depth analysis of matching problems on the regional training market]. https://doi.org/10.3278/6004750w

Solga, H., Protsch, P., Ebner, C., & Brzinsky-Fay, C. (2014). *The German vocational education and training system*. WZB. https://bibliothek.wzb.eu/pdf/2014/i14-502.pdf

Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, *87*(3), 355–374. https://doi.org/10.2307/1882010

Steinhauer, H. W., & Zinn, S. (2016). *NEPS technical report for weightng: Weightng the sample of starting cohort 4 of the National Educatonal Panel Study (Wave 1 to 6)*. LifBi. https://www.neps-data.de/Portals/0/Survey%20Papers/SP_II.pdf

Thurow, L. C. (1972). Education and economic equality. *The public interest*, *28*, 66–81.

Thurow, L. C. (1975). *Generating inequality*. Basic books.

Weßling, K., Hartung, A., & Hillmert, S. (2015). Spatial structure counts: The relevance of regional labour-market conditions for educational transitions to vocational training. *Empirical Research in Vocational Education and Training*, *7*(1), 12. https://doi.org/10.1186/s40461-016-0028-x

Wieling, M., & Borghans, L. (2001). Descrepancies between supply and demand and adjustment processes in the labour market. *Labour*, *15*(1), 33–56. https://doi.org 10.1111/1467-9914.00154

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The Dilemmas of Flexibilisation of Vocational Education and Training: A Case Study of the Piano Makers

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Abstract

Context: Dual VET systems are often praised for their labour market proximity because of economic stakeholders' involvement. However, when labour market requirements change rapidly, a lack of flexibility is attributed to them. This occurs in times of fast socio-technological change like the current digital transformation. A repeatedly proposed measure to increase system flexibility is to reduce the number of occupations and create broader occupational profiles, for example, by combining similar occupations into so-called occupational fields. However, little is known about actually establishing occupational fields.

Approach: Against this backdrop, we address the following research question: How was an occupational field created? As Switzerland attempted to merge occupations over a decade ago, we selected an information-rich and illuminative case concerning the research question: The piano makers' occupation as one of the first occupations required to merge into an occupational field called musical instrument makers together with organ builders and wind instrument makers. Based on a qualitative case study, we reconstruct the process of occupational field construction by combining expert interviews with comprehensive document analysis and present its narrative.

Findings: Based on this case study, we contribute to the understanding of VET flexibilisation by detailing occupational field creation and identifying opportunities and challenges.

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Here, we pay special attention to the institutional work of the affected occupational association and identify the importance of preserving its collective occupational identity. Although regulatory changes disrupted the piano makers' occupation, the occupational association reinstitutionalised it as part of the musical instrument makers' occupational field. Over a decade later, the piano makers reintroduced their former occupational title, which is deeply connected to their occupational identity.

Conclusion: The results indicate that VET reforms that promote flexibilisation by creating occupational fields encounter serious limitations in collectively governed dual VET systems. In the Swiss system, occupational associations are core collective actors that rely on their members' voluntary work. To maintain these economic stakeholders' necessary commitment to VET, their collective occupational identity, symbolized by their long-standing occupational title, needs to be preserved.

Keywords: Vocational Education and Training, VET, Flexibilisation, Occupational Association, Occupational Field, Institutional Work, Occupational Identity

1 Introduction

In collective skill formation systems such as those found in Germany, Austria, and Switzerland, companies, intermediary organisations, and the state work together to provide vocational education and training (VET) (Busemeyer & Trampusch, 2012). To ensure VET is closely linked to labour market needs, state actors delegate important tasks such as the definition of occupational profiles to intermediary associations (employers' or occupational associations and trade unions), who assume an important role in administering, maintaining, and reforming these systems. These systems are also referred to as dual VET systems, because training occurs not only at school but also in companies, mostly in the form of dual apprenticeships (Gessler, 2017).

Further, dual VET systems are characterised by the occupational principle (*Berufsprinzip*), which is a social identification and allocation instrument that ensures a close relationship between certified occupational qualifications and employment activities (Severing, 2014; Hellwig, 2008). Occupations impart a wide range of skills that go beyond a single firm's needs (Clarke, 2011; Clarke et al., 2013). This contrasts with, for example, liberal skill formation systems such as the United States, in which VET is not collectively organised and comparatively narrow on-the-job training aimed at immediate workplace requirements prevails.

The close connection to the labour market via integrating economic stakeholders is often seen as a strength of dual VET systems. Yet, when labour market requirements change rapidly, a lack of flexibility has recurrently been attributed to these systems. This is so, for example, during fast socio-technological change like the current digital transformation. A

repeatedly proposed measure to increase system flexibility is to reduce the number of occupations: For example, by defining core occupations or combining related training occupations into so-called occupational families or occupational fields. This should broaden occupational profiles to improve individual mobility in the labour market and increase training efficiency (Maurer & Pieneck, 2013; Seufert, 2018).

In Switzerland, the flexibilisation of dual VET was attempted in the early 2000s (Häfeli & Gasche, 2002). This allows us to examine an implemented process of flexibilisation in retrospect. As part of a major VET reform, the state administration wanted to reduce the number of occupations and to combine similar occupations into occupational fields and train them together. As the occupational associations in Switzerland are responsible for defining the occupational training content, this provoked substantial institutional work on their part. Institutional work is the purposive action of individual and collective actors aimed at creating, maintaining, or disrupting institutions (Lawrence & Suddaby, 2006). The institutional work perspective states that institutions—or, in our case, occupations—do not only need to be purposefully and actively created and maintained, but their disruption and possible reinstitutionalisation also requires extensive work.

Against this backdrop, we address the following research question: How was an occupational field created? We investigate the case of the piano makers' occupation, which had to merge with organ builders and wind instrument makers into the occupational field of musical instrument makers, as an example of flexibilisation. The long-established traditional handicraft could not uphold the legitimacy of its individual apprenticeship and lost its distinct occupational title in the merging process.

Based on this in-depth case study, we contribute to the understanding of flexibilisation and occupational fields. We detail the process of occupational field construction and identify opportunities and challenges. Here, we pay special attention to the institutional work of the affected occupational association. A key finding is the importance of preserving its collective occupational identity symbolised by its long-standing occupational title.

2 Conceptual Framework

2.1 Occupations and Collective Occupational Identities

Institutions are enduring elements of social life that provide templates for action, cognition, and emotion (Lawrence et al., 2011). An occupation (*Beruf*) can be conceived of as being an institution (Lawrence, 2004; Bechky, 2011). It is defined as "a formally recognized social category, with regulative structure concerning VET, qualifications, promotion and the range of knowledge, both practical and theoretical, that is required to undertake the activities that fall

within it" (Clarke, 2011, p. 103). It represents a division of labour, also referring to particular wage relations, social position, and social status. Apprenticeships define the educational pathways that lead to occupations.

In collective skill formation systems, occupations are based on collective governance where consensus-oriented and time-consuming decision-making involves key sectoral stakeholders (Clarke et al., 2013). Particularly, intermediary organisations such as employer organisations and labour unions occupy a pivotal role in collective governance. Employer organisations are composed of firms or individual professionals and bring knowledge of the skills required by the current economy into the negotiation of training content. Moreover, they provide a platform for their members to exchange information and create shared understandings and normative expectations (Schmitter & Streeck, 1999). Thus, occupations are social constructs resulting from negotiation processes, rather than mere representations of activities found in the labour market (Dehnbostel, 2005; Schwarz & Bretschneider, 2014). It is not only legal regulations but also norms, values, and cultural-cognitive elements that underpin them (Nicklich & Fortwengel, 2017).

More particularly, occupations provide collective occupational identities. Identity, in general, can be understood as "a multi-dimensional classification or mapping of the human world and our places in it, as individuals and as members of collectivities" (Jenkins, 2008, p. 5). Occupational identity answers the question of who we are by way of *what we do* (Ashcraft, 2013). Occupations might be thought of as having collective selves and are distinguished by collective identities. The definition of occupational competences implies constructing an occupational image and shaping the respective professionals' individual identities: "The occupational identity project (what is it that we do?) merges with occupational image (what do we want them to think that we do?) and often entails a corresponding overhaul of individual practitioner identity (who am I?)" (Ashcraft, 2013, p. 14). Individuals are influenced by a vocational habitus, which is informed by the respective vocational culture (Colley et al., 2003). Consequently, individuals might also develop pride in their occupational affiliation.

2.2 Flexibilisation of Dual VET

In the last century, economic and technological development has led to an increasing number of specialised occupations as a result of the differentiation and specialisation of work (Pahl, 2001). The increasing diversity of occupational profiles has repeatedly been a topic of VET policy (Maurer & Pieneck, 2013). While employers are customarily interested in VET that is closely tailored to their needs and allows apprentices to work productively as quickly as possible, narrow occupational profiles can restrict individual mobility in the labour market. Further, it is argued that constant technological change requires broader competencies. In addition, a high number of occupations in dual VET systems raise costs for the public sector,

as occupation-specific offers at VET schools are mostly publicly financed. The discussions, therefore, revolve around how narrowly or broadly occupational profiles should be designed.

In the past, the social construct of "occupation" was repeatedly questioned (Wahle & Walter, 2013). As a result of labour market changes over the last forty years, the erosion of the occupational concept was discussed. In the 1970s and ’80s, flexibility was increased due to the further mechanisation of the labour market and the pluralisation of employment careers. In the 1990s, however, transformed in-company work organisation came into force, which created a demand for broader vocational qualifications. Recent debates about individualised employability were also seen as a departure from occupations as collective structural patterns of the employment system. Nevertheless, the occupational construct proved to be resistant and viable (Weiss, 2014).

Recently, demands for greater flexibility in VET have once more become popular (Seufert, 2018). It is argued that in the age of digital transformation, occupations change at high speed, new occupations emerge, and existing ones die. More recent discussions relate the flexibilisation of dual VET to reducing the number of training occupations by, for example, grouping related occupations into core occupations, structuring occupations into occupational families or occupational groups, or to a (moderate to strong) modularisation of vocational training (Brötz et al., 2008; Euler & Severing, 2006; Hess & Spöttl, 2008; Pilz, 2005; Seufert, 2018).

Constructing an occupational field is one attempt to raise flexibility and reduce complexity. An occupational field unites occupations with certain similarities concerning activity, training path, and requirements (Häfeli & Gasche, 2002). In occupational fields, the training of different occupations can be combined, but there also remains specialised content to account for the peculiarities of individual occupations (Schwarz & Bretschneider, 2014). Constructing occupational fields should provide apprentices with broad skills, improve workers’ mobility within the field, and increase training and regulation efficiency. It should also improve transparency by reducing the amount of information for young people who are about to choose an occupation (Häfeli & Gasche, 2002). Further, there is discussion as to whether the merging of related occupations into occupational fields calls for a new type of didactics in VET schools (Barabasch & Baumeler, 2019).

2.3 Institutional Work and Disruption

As, in collective skill formation systems, occupations are negotiated by employer associations, trade unions, and public authorities (Severing, 2014), collective actors perform institutional work on their occupations. Therefore, flexibilisation measures of VET cannot be implemented by the state without the concerned actors’ actual work.

The institutional work perspective (Lawrence & Suddaby, 2006; Lawrence et al., 2009, 2011, 2013) deals with various forms of institutional change and focuses on the role of actors in these processes. It states that institutions need to be purposefully and actively created, maintained, and disrupted, and highlights the knowledgeable, creative, and practical work of individuals and collective actors attempting to shape institutions. Institutional work involves reflexive awareness and effort and addresses cultural-cognitive, normative, and regulative institutional pillars (Scott, 2008). This theoretical perspective is especially interested in studying institutional work that is "nearly invisible and often mundane, as in the day-to-day adjustments, adaptations and compromises of actors" (Lawrence et al., 2009, p. 1).

The dissolution of a long-standing occupation is an institutional disruption process. Lawrence and Suddaby (2006) base their concept of institutional disruption work on Oliver's (1992) seminal contribution about deinstitutionalisation. She describes it as a "process by which the legitimacy of an established or institutionalized organizational practice erodes or discontinues" (Oliver, 1992, p. 564). From her perspective, organisations fail to continually reproduce previously taken-for-granted actions. This might be the case when changes in the political field, in laws and societal values, or functional economic considerations call into question the legitimacy of a traditional practice. When the organisational environment changes, deinstitutionalisation can be a pro-active and conscious response from organisations. If they have little influence on these changes, deinstitutionalisation can also be a passive or even unconscious reaction.

Building on Oliver's contribution, Lawrence and Suddaby (2006) identified practices that actors use to disrupt institutions purposively, for example, disconnecting a practice from associated sanctions or rewards. With VET reform, such institutional disruption work occurs if the state questions certain occupations' legitimacy by redefining and re-regulating the process and requirements for designing occupational profiles.

However, it is also possible to disrupt existing institutions by developing new ones (Lawrence & Suddaby, 2006). Deinstitutionalisation might foster institutional replacement (Oliver, 1992) or "repair work", which is maintenance work carried out to undo disruption (Micelotta & Washington, 2013). Institutional replacement can also be achieved through reinstitutionalisation. Outsider-driven deinstitutionalisation, such as regulatory change, might destabilise established practices (Maguire & Hardy, 2009; Greenwood et al., 2002). Organisations may react by innovating and seeking solutions. These innovations need to be justified to gain broader acceptance and legitimacy. New ideas and practices are only fully reinstitutionalised when they become taken-for-granted as a natural and appropriate arrangement, embedded and routinised, which allows their reproduction over time.

3 The Swiss Context: VET Reform and Creating Occupational Fields

In the Swiss collective skill formation system, federal and regional authorities, the cantons, as well as intermediary associations of labour market stakeholders are involved in VET governance. Federal authorities are responsible for strategically developing the VET system and enacting the training ordinances, which are drafted by occupational associations. The 26 cantons organise and finance vocational schools, supervise host companies and offer career counselling. In addition to training in firms and VET schools, inter-company courses provide training in industry-specific occupational skills.

Intermediary associations are the main actors concerned with defining occupational training content. This task is delegated to them based on the assumption that they know best what the labour market needs and can ensure continuous VET adaption. Earlier research identified three types of prominent associations in Switzerland, occupational associations, which represent small firms and self-employed professionals, especially in the crafts and domestic sector of the economy; company associations, which unite a sector's firms; and employee associations (Höpflinger, 1984). Contrary to other countries, intermediary associations in Swiss VET are typically organised along occupational (not sectoral) lines: Currently, 146 associations are responsible for at least one of the approximatively 240 initial VET occupations (Emmenegger et al., 2019; Jenkins, 2008). Occupational associations are, therefore, important educational actors that shape the Swiss VET system (Strebel et al., 2019; Baumeler et al., 2018).

Yet, a major vocational training reform in 2004 increased the role of the federal administration regarding content definition: The administration introduced a standardised procedure that all occupations had to follow by updating training content according to the newly introduced training standards (Berner, 2013). One objective of this process was to reduce the number of occupations. The demand for reducing the existing 300 occupations emerged as a result of criticism of Swiss VET as being too inert, overregulated, and inflexible. This would impede its adaption to rapid employment changes. In this context, it was expected that merging occupations would bring economic, educational, and regulatory benefits. It would lead to broader basic training and less specialisation and, thereby, increase individuals' employability and mobility on the labour market (Bundesrat, 2000). It was also argued that higher numbers of apprentices per occupation and year would result in increased efficiency in training, for example, in vocational schools. The public administration assumed that because of the smaller number of training regulations, there would be less documentation and administrative work. This orientation was also informed by educational research (Häfeli & Gasche, 2002). At the centre of the discussion were the 130 small occupations with fewer than 100 apprenticeships per year. Hence, the federal administration urged smaller occupational associations to find synergies with similar occupations and carry out parts of VET together. This led to the disruption of various occupations and the creation of new occupational fields.

4 Method: Qualitative Case Study

We explore our research question by conducting a qualitative case study because we want to identify *how* a flexibilisation measure—an occupational field—was actually created. Qualitative case studies provide a methodological approach that is especially suitable to answer this question (Merriam, 2009; Patton, 2015). The aim of case study research is to conduct in-depth analysis, focussing on the participants' perspective (Harrison et al., 2017). It intends to provide a comprehensive account that helps in understanding the phenomenon. Further, qualitative approaches are suitable for the reconstruction of processes (Langley et al., 2013), and involve questions such as how institutions, or occupations, emerge, develop, or terminate over time.

We used purposeful sampling (Patton, 2015) to select a case that is information-rich and illuminative concerning the research question: The piano makers' occupation, which was one of the first occupations that needed to merge into an occupational field after the 2004 VET reform. In studying this case, we develop an in-depth understanding of the implementation of a flexibilisation measure.

Typically, case studies use various data sources (Harrison et al., 2017). First, we analysed official documents concerning VET reform to set the ground for our empirical study. Second, we conducted semi-structured expert interviews (Bogner et al., 2009; Gläser & Laudel, 2010) (see table 1) lasting between 47 and 127 minutes with a key representative of the occupational association and two educational consultants who advised the occupational reform process. The interview partners were selected for the following reasons: The key representative of the occupational association was their managing director and the driving force behind the establishment of the occupational field. One educational consultant was active at the time when the occupational field was founded and the other one at a later stage, at which the former occupational titles were regained. We regarded them as experts because of their specialised knowledge of the occupational reform process, which allowed us to reconstruct it.

We used an openly constructed interview guideline that encouraged interviewees to share their experiences and their interpretations of the reform process. As we asked retrospective questions about concrete activities in the disruption of the occupation, the creation of the occupational field and the regaining of the former occupational title, we can reconstruct the process according to their point of view from 2004 until today. We analysed the interviews with regard to their perspective of key events in the process.

Although interviewees can provide information for detailing and interpreting activities over time, they also have their shortcomings (for example, forgetfulness or inaccurate detail recollection, Roulston & Myungweon, 2018). Therefore, we triangulated our data with a comprehensive document analysis (between-method triangulation, [Flick, 2018]). We included documents about the disruption of the piano makers' occupation and the subsequent creation of the occupational field called "musical instrument makers" from 1949 until today.

Data sources were official communications (the magazines of the occupational association, website, newspaper articles, government documents, and statistical information), as well as documents that are not publicly available (minutes of meetings) (see table 1).

Table 1: Overview of the Various Data Sources

Expert Interviews	**Archival Data**
1 (127'), key representative of the occupational association during the reform process 1 (49'), educational advisor of the reform process (early stage) 1 (47'), educational advisor of the reform process (later stage)	44 Magazines of the occupational association (2009-2020), 28 government documents (ordinances, education plans, federal council decisions 1949-2019), 23 minutes of meetings of the musical instrument makers' Commission for Occupational Development & Quality (2010-2018), 13 newspaper articles, 2 statistical databases, website of the occupational association musical instrument makers

In total, we analysed 111 archival data. To characterise the broader context, data from two statistical databases were used to determine the number of piano makers' apprentices since 1965. The newspaper articles provided background information on the occupation and daily work of piano makers and the international developments in the piano market.

To determine the chronology of the process, the analysis of the 28 official government documents including ordinances, education plans and federal council decisions from 1949 to 2019, allowed the identification of the time course and the outcomes of the piano makers' institutional work. Further, the analysis of the occupational association's website allowed the identification of its self-presentation and statutes. Since 2009, the occupational association has published its own magazine aimed at its member companies. Here, it was possible to find more information about the main topics of the construction of the occupational field, the opening of the VET school and the reasons for the re-implementation of the former occupational titles. Furthermore, by accessing the minutes of the musical instrument makers' Commission for Occupational Development and Quality from 2010-2018, we were able to identify further information on decisions regarding adjustments to its apprenticeship.

In combining the different longitudinal data sources, we were able to reconstruct the process of occupational field construction. While the interview data made it possible to identify the perspectives and explanations of key actors, we used the archival documents to identify the context, chronology, outcomes and main topics of the process.

First, we ordered our data chronologically and identified three main stages of the reform process (disruption of the piano makers' occupation, reinstitutionalisation within the

occupational field, regaining their former occupational title). Second, we connected the different phases with the interviewees' interpretations. For each phase, we identified the major themes that were important for the process, for example how it was decided which occupations should merge to an occupational field, what kind of institutional work was needed to implement the occupational field and which processes and discussions led to the regaining of the former occupational titles. As we used a qualitative research design, it also allowed us to identify themes that emerged from the data, such as the importance of preserving the collective occupational identity. The data was collected and analysed while abiding by ethical research guidelines, such as informed consent and the preservation of anonymity (Schweizerische Gesellschaft für Soziologie, 2007).

5 Results

Piano making and tuning have always been a niche occupation with low numbers of apprentices. The association of the piano makers, founded in 1947, brings together around 240 piano makers and tuners from all Swiss language regions. It defines the content of vocational training, arranges expertise, and organises events and further training. Management of the association comprises mostly owners of small businesses who work on a voluntary basis.

Yet, while in the 20th century a piano still belonged in every good room, in the 1960s the Swiss had to compete with imports from the Far East. Simultaneously, modern residential construction meant larger pianos hardly found any room. Today, ten times more digital than acoustic pianos are imported into Switzerland and musical instrument makers specialising in the piano are mainly concerned with maintaining, repairing, and tuning these instruments (Grossrieder, 2018).

5.1 Disruption of the Piano Makers' Occupation

During the VET reform, the federal administration identified piano makers as one of the small occupations that should be merged into an occupational field. They informed the piano makers and tuners' association that their occupation could no longer exist if it was not integrated into an occupational field with other small craft occupations in the woodworking sector. This started the outsider-driven deinstitutionalisation process and provoked substantial institutional work of the piano makers association.

Fearing their occupation would lose its recognition, the association first discussed possibly abandoning their apprenticeship or stopping training in Switzerland and sending apprentices to a German training centre. However, they rejected the latter idea with the argument that training in Germany lasted only three years instead of four and thus would not offer the same

training quality. Moreover, this training was not offered in French and, therefore, French-speaking Swiss would be left behind.

Hence, the association decided to participate in the meetings organised by the public administration to determine whether merging with other wood occupations would be possible. These first meetings revealed large differences in the individual occupational activities of the present occupations. However, the occupations that built and maintained musical instruments showed more commonalities than other woodworking occupations. As the key representative of the piano makers remembers:

> So, we were the smallest occupations in the craft "working with wood". (...) We were perhaps eight or ten occupations - and (the state administration) arbitrarily made this division and put it in front of us. You are in this pot. And then, there was the phase of anger and indignation. That was predicted to us in advance. Then, (…) the other occupations said, but you have 270 members. The organ builders' association is also relatively large. And the wind instrument makers are also bigger. They all only deal with music. And we're supposed to have a common occupation? And we should learn how to tune? That's nonsense. There was a lot of debate and there was the separation. Then we said, well, then we'll found the occupational association of the musical instrument makers.

Consequently, as one of the first small occupations, the piano makers joined forces with the wind instrument makers and the organ builders to create the occupational field of the musical instrument makers, which implied founding a new umbrella occupational association. The three occupational associations, the federal administration, and the cantons agreed to this solution. Thus, they became pioneers in establishing an occupational field, which also meant that piano makers started reinstitutionalising their apprenticeship within a larger framework.

However, merging came at a high price for piano makers. The federal administration did not allow them to keep their long-standing occupational title. Instead, from then on, they were called "musical instrument makers with a specialisation in piano making and tuning". For the key representative of the piano makers, it was difficult and painful to communicate this loss of identity to members of the association:

> We are piano makers! We are not musical instrument makers! We didn't feel at home there. But we had to swallow this toad. We on the board swallowed this toad at some point and said: Okay, if there's no other way, then that's the way it is, then we'll bite the bullet. But then, we suddenly had to stand there and present it to our people as if we were deeply convinced of the whole story. That, of course, caused us trouble. That wasn't a funny situation at all.

5.2 Reinstitutionalisation Within an Occupational Field

Creating an occupational field involved merging three different occupational associations with their respective apprenticeships, which required significant institutional work. The first challenge was identifying common educational content for the different apprenticeships and determining the areas in which occupation-specific education was required. Moreover, all educational plans were to be elaborated in accordance with the new paradigm of competence orientation, introduced in the early 2000s. The public administration supported the occupational reforms financially, which allowed for developing new educational plans and teaching materials. An educational advisor was commissioned to provide support and the process was initiated in accordance with the legal requirements. As the key representative of the piano makers' association remembers:

> One of the most difficult tasks was to draw up the education ordinance and plan. We had to be competence-oriented. We knew we had to glue, drill, mill, saw, regulate (...). And we had to define the competences. We didn't know that. (...) We had to do this integration of the different occupations. We had to determine which competencies we could teach at the beginning and where it began to separate. It's like a pyramid that we have a wide stick at the beginning. We all work with wood. We all have musical history. So at the beginning, we could put all apprentices into one class and then with the years of the apprenticeship, it separated more and more. We proceeded exactly according to this scheme. That was one of the most difficult and demanding activities.

A reform commission, including representatives of the federal administration and the cantons, the presidents and examination experts of the associations, as well as some teachers and the Swiss trade association, was formed. They held detailed discussions on merging the occupations because of the novelty of the procedure.

Further, the musical instrument makers had to find a location for their new vocational school and training centre. Only the thirteenth attempt was successful. Whereas several cantons rejected an application, one canton saw the musical instrument makers' request as an opportunity to revive a semi-vacant agricultural vocational school. To equip the school with training material and a new workshop, the occupational association of the piano makers convinced private sponsors who donated a considerable amount of money.

Implementing occupational reform reached the limits of the voluntary system. As the key representative of the piano makers' association states:

> It has always gone sharp to the maximum pain threshold. So the hours we needed are simply God's wages. Everyone knew that he was doing it for his occupation. That it was like a matter of honour that you just do that. That one likes to do that. So, in the sense. But we could never hire people at the wage they actually needed. Never.

It became clear that professional management of the musical instrument makers' umbrella organisation was indispensable because the organisation's members, who had previously worked voluntarily, were no longer able to cope with the additional workload and the loss of income while doing institutional work. As one educational advisor explains:

> The piano makers are mostly sole proprietors. Few are employed in larger companies (...). If someone (…) worked for the association, then nothing happened in his business and he would earn no money.

This meant that paid staff had to be hired. However, the associations' membership fees were insufficient to finance the administration of the umbrella association. Because the VET Act newly permitted establishing a mandatory VET fund to which all companies must contribute, regardless of whether they train apprentices or not, the occupational association decided to set up such a scheme to raise additional funds. This led to some contestations and, finally, a person who did not want to pay was sued. As the key representative of the piano makers' occupational association remembers:

> There was also someone who wanted to take it to the extreme and said: I certainly won't pay anything! I don't have any employees and I don't repair anything! Then someone he didn't know brought him a trumpet and he said: Of course I can fix it! There we had the proof! Then he went to court and then came the moment of truth. Does the system work? We were anxious about this moment, because we thought if the court said no, then the whole thing would collapse like a house of cards. But the court said that's right what you did. It's quite clear, he has to pay.

In addition, the association argued that importers of musical instruments also benefitted from the good education in Switzerland. Because they had an interest in skilled workers able to maintain the instruments, the association got a levy from these firms.

Finally, the musical instrument makers' apprenticeship with five specialisations (wind instrument making, wind instrument repair, piano making, organ building, organ pipe building) came into force in 2008. Since then, the training consists of a basic study course, organised with other instrument makers, and specific learning content concerning piano making and tuning. On average, 12 apprentices per year start the musical instrument makers' apprenticeship nationwide. During their training, apprentices build an acoustic piano and thus gain in-depth knowledge of the structure and interaction of the instrument's individual parts. The lessons in the training centre are held bilingually and the learning material is available in German and French.

5.3 Regaining Their Former Occupational Title

The new VET Act stipulates that all training occupations must be reviewed and adapted at regular intervals. In 2014, a review of the apprenticeship "musical instrument maker" was carried out. Questionnaires for evaluating the apprenticeship were sent to workplace trainers, VET teachers, and examiners as well as to apprentices. The results were pleasing and the apprenticeship was rated as good to very good. Around 50% of the apprentices stayed with their companies after completing their training. However, it was criticised that still no common occupational identity as musical instrument makers had developed.

The association of the musical instrument makers decided to revise their apprenticeship and set up a new training ordinance. The most important aim was to regain their former occupational titles. Therefore, all competencies had to be newly described and approved separately for each occupation within the occupational field. The VET content did not change much and cooperation between the individual occupations continued. However, they were no longer called "musical instrument makers". Since 2020, the individual occupations have again a diploma on which their former occupational title (for example, piano maker) is written. As the key representative of the piano makers' association explains:

> Therefore, it's just—we then have our family name again. That's the most important thing that changes that way. There are several other things that change, but that was for the piano builder family and the organ builder family such a flaw. This flaw is now being abolished.

Finally, from the point of view of an educational advisor, it was possible to find synergies in cross-occupational competences (e.g., customer consulting, music history) and then train them at a common school location. However, having created an occupational field did not allow musical instrument makers more labour market flexibility because the occupational competences remained too specific, even if partially trained together:

> The public administration wants, (...) that there are synergies and that people become more mobile. But an organ builder is completely different from a piano builder. Sorry, you can't use an organ builder as a piano builder in a rush, and you won't be able to do that in the future either.

Thus, in the case of the musical instrument makers, creating an occupational field only reached one of the intended aims of the policy reform by increasing training efficiency, but there was no higher labour market mobility for trained workers.

6 Discussion and Conclusion

Dual VET systems are often praised for their proximity to the labour market because of economic stakeholders' involvement. Nevertheless, they are criticised for being too complex and slow in times of a rapidly changing world of work. The differentiation into many specialised occupations is regarded as being inert, regulation-intensive, and inflexible. One repeatedly proposed solution is to reduce the number of occupations. This is supposed to increase training efficiency and workers' mobility.

The case of the piano makers shows how a regulatory reform delegitimised the existence of a long-standing handicraft occupation. Although the implementation of the flexibilisation measure was influenced by pedagogical concepts, it was carried out top-down by an administrative logic. The piano makers, therefore, needed to merge with other occupations into an occupational field. Yet, the occupation did not just disappear. Rather the piano makers' association developed institutional work to reinstitutionalise their occupation.

Once the small occupations of the piano makers, wind instrument makers and organ builders were disrupted by public administrations' request to merge, their occupational associations started developing innovative solutions. First, they established a new umbrella association and identified synergies in the training content of the individual occupations. This resulted in developing a new training ordinance. In addition, they had to establish the training infrastructure for common vocational schooling. The new training ordinance required purchasing equipment and producing bilingual teaching materials to train all Swiss apprentices together in one location. In addition, VET schoolteachers and workplace trainers had to attend further training. This preparatory work was needed for creating new training routines and embedding the musical instrument makers' apprenticeship in the existing educational landscape. Yet, creating training regulations and establishing the new infrastructure demanded too much voluntary work. This led to professionalisation of the new umbrella association for which paid staff was hired. Moreover, to finance the equipment and staff, the occupational associations needed to raise additional resources.

Importantly, the federal administration initially obliged them to abandon their traditional occupational title of piano makers in favour of the new occupational field title "musical instrument makers". However, the association members' occupational identity and pride fuelled their commitment and motivated them to work for their association voluntarily. Our case study suggests their occupational title is so important to their identity that the piano makers were ready to face additional administrative workload to re-introduce it over ten years following the creation of the occupational field. With this step, they completed their reinstitutionalisation work that finally resulted in establishing a new form of training together with other occupations that, nevertheless, leads to the traditional occupational titles.

In sum, the case study of occupational field creation revealed the following opportunities and challenges: Synergies in the area of vocational schooling, which increased efficiency,

were achieved. Yet, from the perspective of the association, this increased efficiency of VET schooling was initially outweighed by the workload and need for additional financial resources for establishing the new training ordinance and infrastructure. Moreover, the attempt to create a new collective occupational identity for musical instrument makers failed and training in this occupational field does not seem to allow for greater occupational mobility.

What can we learn from this single case study about the broader topic of flexibilisation of VET? How can the findings of the case study be transferred to other situations in different contexts (in the sense of *transferability* as a qualitative approach to generalization [Maxwell & Chmiel, 2014; Schreier, 2018])? As with every qualitative research, the presented case study is highly contextualised.

Switzerland's collective skill formation system relies heavily on the involvement of occupational associations to which central tasks are delegated (e.g., the definition of vocational curricula, responsibility for providing apprenticeships). Thus, implementing reforms to flexibilise VET requires cooperating with these associations, which may develop institutional work to resist change, maintain their position, or reinstitutionalise their occupations. Policy measures informed by educational-conceptual considerations may reach limits when the motivations of the executing actors are not considered. To reduce complexity and the number of occupations, public authorities are confronted with the specific needs of a large number of, mainly small, occupational associations. Importantly, many of these occupational associations rely on members carrying out voluntary work. Our findings suggest that members' voluntary engagement is fostered by connection to their occupational identity and pride. If their occupational identity is not preserved, occupational associations may engage in institutional work to reinstitutionalise it or, if they fail to do so, they might no longer be committed to offering apprenticeships and their members might lose their willingness to train. Consequently, if flexibilisation measures, such as the creation of occupational fields, threaten occupational identities, this may drive the system away from its voluntary character towards a system that is based on more professional, paid work—which may ultimately increase training costs.

In conclusion, the flexibilisation measure of creating an occupational field at least partially calls into question the occupational principle that underpins dual VET systems. Thus, such a policy measure cannot be implemented without considering the governance structure of the respective VET system. Occupational titles that reflect the collective identity of occupational associations respect the crucial role of these intermediary organisations. Therefore, this case study indicates that policymakers may need to strike a balance between searching for training synergies and respecting occupational identities.

Our study points out that a reconstruction of the implementation process of other occupational fields could yield important insights for future flexibilisation measures. It highlights aspects that should first be assessed *together* with the affected occupations when initiating

the implementation of new occupational fields. Where are actual benefits to be expected? What level of work and costs does such a reform trigger? Are apprentices also employable in related occupations after training in an occupational field? The consequences of not respecting or consulting occupational experts may be that the measures taken are not sufficiently labour market–oriented, and that implementation fails due to a lack of commitment on the part of those concerned. For the associations of small occupations whose existence may be threatened, this means that they must recognise important pillars of their occupational identity at an early stage and protect them accordingly, vis-à-vis the authorities. In times of reform and change, it is important that the associations involve their members in these processes to secure their commitment. Finally, it is important to emphasise that there is also something to be gained: The creation of occupational fields can certainly lead to positive experiences and synergy with other, similar occupations, and trigger a surge of professionalisation. However, as only little is known about the actual implementation of flexibilisation measures in dual VET, further research is needed to identify opportunities and challenges within the different contexts of other dual VET systems.

References

Ashcraft, K. L. (2013). The glass slipper: "Incorporating" occupational identity in management studies. *Academy of Management Review, 38*(1), pp. 6–31. https://www.jstor.org/stable/23416300

Barabasch, A., & Baumeler, C. (2019). Berufsfelddidaktik in der Schweiz: Internationale Einbettung, Ausdifferenzierung und konkrete Umsetzung [Professional field didactics in Switzerland: International embedding, differentiation and concrete implementation]. *bwp@ Berufs- und Wirtschaftspädagogik – online*, 1–5. https://www.bwpat.de/ausgabe/spezial16

Baumeler, C., Engelage, S., & Strebel, A. (2018). Creation, maintenance, and disruption. Occupational associations and their heterogeneous institutional work after the Swiss VET policy reform. In C. Nägele & B. E. Stalder (Eds.), *Trends in Vocational Education and Training Research. Proceedings of the European Conference on Educational Research (ECER)*. Vocational Education and Training Network (pp. 61–69). VETNET. https://eera-ecer.de/ecer-programmes/conference/23/contribution/44171/

Bechky, B. A. (2011). Making organizational theory work: Institutions, occupations, and negotiated orders. *Organization Science*, *22*(5), 1157–1167. https://doi.org/10.1287/orsc.1100.0603

Berner, E. (2013). "Verbundpartnerschaft" - Schlagwort oder Erfolgsrezept? [Collective skill formation system - Keyword or recipe for success?]. In M. Maurer & P. Gonon (Eds.), *Herausforderungen für die Berufsbildung in der Schweiz* (pp. 37–60). HEP.

Bogner, A., Littig, B., & Menz, W. (2009). *Interviewing Experts*. Palgrave Macmillan. https://doi.org/10.1057/9780230244276

Brötz, R., Schapfel-Kaiser, F., & Schwarz, H. (2008). Berufsfamilien als Beitrag zur Stärkung des Berufsprinzips [Occupational families as a contribution to strengthening the occupational principle]. *BWP Berufsbildung in Wissenschaft und Praxis, 4*, 23–25. https://www.bibb.de/veroeffentlichungen/de/publication/download/id/1368

Bundesrat. (2000). Botschaft zu einem neuen Bundesgesetz über die Berufsbildung. [Bulletin on a new federal law on vocational education and training]. *Bundesblatt*, 5686–5774. https://www.admin.ch/opc/de/federal-gazette/2000/index_47.html

Busemeyer, M., & Trampusch, C. (2012). Introduction: The comparative political economy of collective skill formation. In M. Busemeyer & M. C. Trampusch (Eds.), *The Political Economy of Collective Skill Formation* (pp. 3–40). Oxford University Press. https://dx.doi.org/10.1093/acprof:oso/9780199599431.003.0001

Clarke, L. (2011). Trade? Job? Or occupation? The development of occupational labour markets for bricklaying and lorry driving. In M. Brockmann, L. Clarke & C. Winch (Eds.), *Knowledge, skills and competence in the European labour market: What's in a vocational qualification?* (pp. 102–19). Routledge. https://westminsterresearch.westminster.ac.uk/item/8zx91/trade-job-or-occupation-the-development-of-occupational-labour-markets-for-bricklaying-and-lorry-driving

Clarke, L., Winch, C., & Brockmann, M. (2013). Trade-based skills versus occupational capacity: The example of bricklaying in Europe. *Work, Employment and Society*, *27*(6), 932–951. https://doi.org/10.1177/0950017013481639

Colley, H., James, D., Diment, K., & Tedder, M. (2003). Learning as becoming in vocational education and training: Class, gender and the role of vocational habitus. *Journal of Vocational Education and Training*, *55*(4), 471–498. https://doi.org/10.1080/13636820300200240

Dehnbostel, P. (2005). Zum Verhältnis von Arbeiten und Lernen in der betrieblichen Ausbildung [On the relationship between work and learning in company-based training]. In H. Loebe, E. Severing (Eds.), *Prozessorientierung in der Ausbildung* (pp. 7–20). Bertelsmann Verlag.

Emmenegger, P., Graf, L., & Strebel, A. (2019). Social versus liberal collective skill formation systems? A comparative-historical analysis of the role of trade unions in German and Swiss VET. *European Journal of Industrial Relations*, *26*(3), 263–278. https://doi.org/10.1177/0959680119844426

Euler, D., & Severing, E. (2006). *Flexible Ausbildungswege in der Berufsbildung* [Flexible training paths in vocational education and training]. Forschungsinstitut Berufliche Bildung (f-bb). https://www.f-bb.de/fileadmin/user_upload/Studie_Flexible_Ausbildungswege_in_der_Berufsbildung.pdf

Flick, U. (2018). Triangulation in data collection. In U. Flick (Ed.), *The SAGE Handbook of Qualitative Data Collection* (pp. 527–544). Sage. https://doi.org/10.4135/9781526416070.n34

Gessler, M. (2017). The lack of collaboration between companies and schools in the German dual apprenticeship system: Historical background and recent data. *International Journal for Research in Vocational Education and Training*, *4*(2), 164–195. https://doi.org/10.13152/IJRVET.4.2.4

Gläser, J., & Laudel, G. (2010). *Experteninterviews und qualitative Inhaltsanalyse als Instrumente rekonstruierender Untersuchungen* [Expert interviews and qualitative content analysis as instruments of reconstructive research]. VS Verlag. https://cds.cern.ch/record/1336155/files/9783531172385_TOC.pdf

Greenwood, R., Suddaby, R., & Hinings, C. R. (2002). Theorizing change: The role of professional associations in the transformation of institutionalized fields. *Academy of Management Journal*, *45*(1), 58–80. https://www.jstor.org/stable/3069285

Grossrieder, B. (2018, January 21). Besuch bei den letzten Klavierstimmern [Visit to the last piano tuners]. *Neue Zürcher Zeitung*. https://www.nzz.ch/gesellschaft/zu-besuch-bei-den-letzten-klavierstimmern-ld.1348460?reduced=true

Häfeli, K., & Gasche, M. (2002). *Beruf und Berufsfeld: Konzeptionelle Überlegungen zu kontroversen Begriffen* [Occupation and occupational field: Conceptual considerations on controversial terms]. BBT. https://edudoc.educa.ch/static/infopartner/sammlung_fs/2002/SIBP/sibp_Berufsfelder.pdf

Harrison, H., Birks, M., Franklin, R., & Mills, J. (2017). Case study research: Foundations and methodological orientations. *Forum qualitative Sozialforschung/ Forum Qualitative Social Research*, *18*(1). https://nbn-resolving.de/urn:nbn:de:0114-fqs1701195

Hellwig, S. (2008). *Zur Vereinbarkeit von Competency-Based Training (CBT) und Berufsprinzip - Konzepte der Berufsbildung im Vergleich* [On the compatibility of Competency-Based Training (CBT) and occupational principle - concepts of vocational education and training in comparison]. Springer VS. https://doi.org/10.1007/978-3-531-90981-3

Hess, E., & Spöttl, G. (2008). Kernberufe als Baustein einer europäischen Berufsbildung [Core occupations as a component of European vocational education and training]. *BWP Berufsbildung in Wissenschaft und Praxis*, *37*(4), 27–30.

Höpflinger, F. (1984). Verbände [Associations]. In U. Klöti (Ed.), *Handbuch politisches System der Schweiz* (pp. 163–188). Haupt.

Jenkins, R. (2008). *Social Identity.* Routledge. https://doi.org/10.4324/9780203463352

Langley, A., Smallman, C., Tsoukas, H., & Van de Ven, A. (2013). Process studies of change in organization and management: Unveiling temporality, activity, and flow. *Academy of Management Journal*, *56*(1), 1–13. https://www.jstor.org/stable/23414342

Lawrence, T. B. (2004). Rituals and resistance: Membership dynamics in professional fields. *Human Relations, 57*(2), 115–143. https://doi.org/10.1177/0018726704042924

Lawrence, T. B., Leca, B., & Zilber, T. B. (2013). Institutional work: Current research, new directions and overlooked issues. *Organization Studies*, *34*(8), 1023–1033. https://doi.org/10.1177/0170840613495305

Lawrence, T. B., Suddaby, R., & Leca, B. (2011). Institutional work: Refocusing institutional studies of organization. *Journal of Management Inquiry*, *20*(1), 52–58. https://doi.org/10.1177/1056492610387222

Lawrence, T. B., Suddaby, R., & Leca, B. (2009). *Institutional work: Actors and agency in institutional studies of organizations*. Cambridge University Press. https://doi.org/10.2189/asqu.2010.55.4.673

Lawrence, T. B., & Suddaby, R. (2006). Institutions and institutional work. In S. R. Clegg, C. Hardy, T. B. Lawrence & W. R. Nord (Eds.), *The SAGE Handbook of Organization Studies* (pp. 215–254). Sage. https://www.academia.edu/6776718/Institutions_and_institutional_work

Maguire, S., & Hardy, C. (2009). Discourse and deinstitutionalization. The decline of DDT. *Academy of Management Journal*, *52*(1), 148–78. https://www.jstor.org/stable/40390280

Maurer, M., & Pieneck, S. (2013). Die Reform von Berufsbildern als ständige Auseinandersetzung über Form und Inhalt [The reform of occupational profiles as an ongoing debate about form and content]. In M. Maurer & P. Gonon (Eds.), *Herausforderungen für die Berufsbildung in der Schweiz* (pp. 81–100). HEP. https://www.hep-verlag.ch/media/import/preview/herausforderungenfuerdieberufsbildung.pdf

Maxwell, J. A., & Chmiel, M. (2014). Generalization in and from qualitative analysis. In U. Flick (Ed.), *The SAGE Handbook of Qualitative Data Analysis* (pp. 540–553). Sage. https://doi.org/10.4135/9781446282243.n37

Merriam, S. B. (2009). *Qualitative research. A guide to design and implementation. Revised and expanded from qualitative research and case study applications in education*. Wiley & Sons.

Micelotta, E. R., & Washington, M. (2013). Institutions and maintenance: The repair work of Italian professions. *Organization Studies*, *34*(8), 1137–1170. https://doi.org/10.1177/0170840613492075

Nicklich, M., & Fortwengel, J. (2017). Explaining the puzzling stagnation of apprenticeships in Germany's security services: A case of insufficient institutional work? *Journal of Professions and Organization*, *4*(3), 302–323. https://www.researchgate.net/publication/318987480_Explaining_the_puzzling_stagnation_of_apprenticeships_in_Germany%27s_security_services_A_case_of_insufficient_institutional_work

Oliver, C. (1992). The antecedents of deinstitutionalization. *Organization Studies*, *13*(4), 563–588. https://doi.org/10.1177/017084069201300403

Pahl, J.-P. (2001). Berufsfelder – Basis fachwissenschaftliche und didaktischer Reflexionen beruflichen Lernens [Occupational fields - Basis of scientific and didactic reflections on vocational learning]. In K. Häfeli, M. Wild-Näf & T. Elsässer (Eds.), *Berufsfelddidaktik. Zwischen Fachsystematik und Handlungsorientierung* (pp. 17–37). Schneider Verlag.

Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice*. Sage.

Pilz, M. (2005). Modularisierung in der Beruflichen Bildung. Ansätze, Erfahrungen und Konsequenzen im europäischen Kontext [Modularisation in vocational education and training. Approaches, experiences and consequences in the European context]. *Schweizerische Zeitschrift für Bildungsforschung*, *27*(2), 207–230. https://docplayer.org/163783070-Matthias-pilz-hg-modularisierungsansaetze-in-der-berufsbildung-deutschland-oesterreich-schweiz-sowie-grossbritannien-im-vergleich.html

Roulston, K., & Myungweon, C. (2018). Qualitative interviews. In U. Flick (Ed.), *The SAGE Handbook of Qualitative Data Collection* (pp. 233–249). Sage. https://doi.org/10.1177/1468794117721738

Schmitter, P. C., & Streeck, W. (1999). The organization of business interest. *MPIfG Discussion Paper*, *99*(1). Max-Planck-Institut für Gesellschaftsforschung. https://pure.mpg.de/pubman/faces/ViewItemFullPage.jsp?itemId=item_1235421_1

Schreier, M. (2018). Sampling and generalization. In U. Flick (Ed.), *The SAGE Handbook of Qualitative Data Collection* (pp. 84–98). Sage. http://dx.doi.org/10.4135/9781526416070.n6

Schwarz, H., & Bretschneider, M. (2014). Strukturmodelle als Ansatz zur Flexibilisierung anerkannter Ausbildungsberufe im dualen System [Structural models as an approach to making recognised training occupations in the dual system more flexible]. In E. Severing & R. Weiβ (Eds.), *Weiterentwicklung von Berufen - Herausforderungen für die Berufsbildungsforschung* (pp. 181–197). Bertelsmann Verlag. https://www.agbfn.de/dokumente/pdf/agbfn_14_schwarz_bretschneider.pdf

Schweizerische Gesellschaft für Soziologie. (2007). *Ethik in der soziologischen Praxis* [Ethics in sociological practice]. Bulletin, 132. Seismo. https://www.sgs-sss.ch/wp-content/uploads/2016/03/Bulletin_132.pdf

Scott, W. R. (2008). *Institutions and organizations. Ideas and interests*. Sage. https://digitalcommons.usu.edu/unf_research/55/

Seufert, S. (2018). *Flexibilisierung der Berufsbildung im Kontext fortschreitender Digitalisierung* [Flexibilisation of vocational education and training in the context of progressive digitisation]. SBFI. https://www.sbfi.admin.ch/sbfi/de/home/dienstleistungen/publikationen/publikationsdatenbank/berufsbildung-digitalisierung.html

Severing, E. (2014). Weiterentwicklung von Berufen – Herausforderungen für die Berufsbildungsforschung [Development of occupations - Challenges for VET research]. In E. Severing & R. Weiβ (Eds.), *Weiterentwicklung von Berufen - Herausforderungen für die Berufsbildungsforschung* (pp.

5–10). Bertelsmann Verlag. https://www.pedocs.de/volltexte/2015/10084/pdf/Severing_2014_Weiterentwicklung_von_Berufen.pdf

Strebel, A., Engelage, S., & Baumeler, C. (2019). Der Beitrag der "institutional work"-Perspektive zu Educational Governance. Dezentrale institutionelle Arbeit in der Berufsbildung [The contribution of the "institutional work" perspective to educational governance. Decentralised institutional work in VET]. In R. Langer & T. Brüsemeister (Eds.), *Handbuch Educational Governance Theorien* (pp. 201–218). Springer VS. https://doi.org/10.1007/978-3-658-22237-6_10

Wahle, M., & Walter, M. (2013). Beruf, Beruflichkeit, Berufsbildung [Occupation, occupational becoming, vocational education and training]. *bwp@ Berufs- und Wirtschaftspädagogik - online*. https://www.bwpat.de/ht2013/ws23/wahle_walter_ws23-ht2013.pdf

Weiss, R. (2014). Zwischen wissenschaftlicher Relevanz und politischer Akzeptanz – Die Rolle der Forschung bei der Entwicklung und Strukturierung von Berufen [Between scientific relevance and political acceptance - The role of research in the development and structuring of occupations]. In E. Severing & E. R. Weiss (Eds.), *Weiterentwicklung von Berufen – Herausforderungen für die Berufsbildungsforschung* (pp. 11–29). Bertelsmann Verlag. https://doi.org/10.3278/111-061w011

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Transition From Low-Threshold Vocational Education and Training to Work in Switzerland: Factors Influencing Objective and Subjective Career Success

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Abstract

Context: There are currently two low-threshold vocational education and training (VET) options in Switzerland for young people at risk: A two-year programme for a Federal VET certificate and a practical training programme designed for young people with special needs. In the present study, we looked at transitions from these programmes to the labour market. Possible influences on objective and subjective indicators of career success, such as social background, personal disposition, and training, were considered.

Methods: Data were collected from 418 apprentices in the French- and German-speaking parts of Switzerland at three measurement points: t1, at the beginning of training; t2, upon completion of training; and t3, 10 months later. Participants responded to a written questionnaire.

Findings: Ten months after completing their apprenticeships, the majority of participating young people were either employed or continuing their education. Results of the multinomial logistic and linear regressions showed a differentiated, rather than uniform, picture depending on the criteria for career success. The background factors of gender and school (9th grade) were associated with objective success after the apprenticeship ended but not

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with subjective career success (hypothesis 1). For the variables concerning person disposition and agency (hypothesis 2), we found two plausible associations: A positive attitude towards life helped with unemployment avoidance and a highly self-rated school performance was associated with later satisfaction. As predicted in hypothesis 3, situational factors related to the VET company and school showed a number of significant but sometimes weak associations with objective and subjective career success. Additionally, competencies and support of VET trainers related to continuance in the learned profession.

Conclusions: The career development paths of young people are influenced by various background and personality factors, as well as the training situation. VET trainers should be aware of their crucial role and understand how their interventions affect apprentices' self-perceptions and perceptions of their learned professions, which consequently influence their motivations and career aspirations. The situation at the VET school (as a learning and social place) is equally important, especially because of the aim to increase permeability for further training. Young people not in employment, education or training (NEET) are of particular concern. Even though this group is smaller in Switzerland than in most other countries, a number of problematic symptoms can be detected during apprenticeship that point to the need for the prevention of a later NEET status.

Keywords: Vocational Education and Training, VET, Special Education, Career Development, Outcomes of Education and Training, Employment

1 Introduction

The transition from school to work has become a political issue in Switzerland because of its lengthening and complexification (Bergman et al., 2011; Sacchi & Meyer, 2016). In this context, transition is an even bigger challenge for young people with special educational needs, those with a migration background, and youth at risk in general (Hofmann & Schellenberg, 2019; Bynner, 2012; Schmid, 2020). These young people may have specific problems finding suitable apprenticeships and fulfilling the relevant requirements. Furthermore, they have a higher risk of dropping out of training programmes (Hupka & Stalder, 2011). This situation is not unique to Switzerland; it is a concern for other European countries also (Bergman et al., 2011; Fasching et al., 2017). Accordingly, there is much concern about young people who do not succeed—those who are not employed or receiving education or applicable training (NEET status; Carcillo & Königs, 2015). Moreover, there is still insufficient information about the career development of youths with special educational needs, especially regarding *factors that facilitate the transition* from VET to the labour market for this group.

Qualifications at the upper secondary level have proven to be one especially important factor for labour market opportunities (Carcillo & Königs, 2015). In this context, "dual" systems for apprenticeship training with two learning places—the training company and the vocational school—have turned out to be particularly successful (Robson, 2010). In Switzerland, two-thirds of young people follow this pathway after completing their compulsory schooling (Stalder & Nägele, 2011). Youths with special needs, as well as those with linguistic or behavioural difficulties, are often guided towards a two-year programme with a federal VET certificate, which is a low-threshold alternative to the three- or four-year federal VET diploma (Hofmann & Müller, 2017; Hofmann, 2019). Apprenticeship training follows a standardised programme focused on practical activities and can be fulfilled for approximately fifty occupations. When this programme was introduced, experts in the field of special education were concerned about the increased demands. As a consequence, the association of institutions for people with handicaps, INSOS (Nationaler Branchenverband der Institutionen für Menschen mit Behinderung), introduced another two-year programme called "Practical Training" to bridge the gap to the basic federal VET programme. Both low-threshold programmes aim to improve employability and to ensure that young professionals meet the demands of the labour market in their learned professions. The results of a previous longitudinal study (Kammermann, 2010) confirmed that the chances of finding jobs in firms other than the training firms have increased; permeability for further training has also improved. Nevertheless, 12% of the young people in this study were unemployed after completing their apprenticeships—a higher figure than the average unemployment rate of 6% for those aged 15-24 years in Switzerland (BFS, 2019).

This highlights the importance of knowing more about other important influencing factors related to the transition from VET to employment. Besides social background and individual resources, support and counselling are important for promoting a smooth transition for this special group of young people, according to previous studies (Kammermann, 2010). In this paper, we refer to a socio-ecological model in which dimensions of agency, as well as social resources in the proximal settings of the social context (family, migration), are considered (Schoon & Lyons-Amos, 2017). During the transition period, the *training or work setting* can also be important (Fouad & Bynner, 2008). According to a previous study in the context of low-threshold apprenticeships, skill variety and support from the trainer play important roles in career development following the completion of training (Hofmann et al., 2014). Moreover, a general question remains regarding how to measure career success or successful school-to-work transition for disadvantaged young people. Typically, career success is differentiated by objective (e.g. status, salary) and subjective aspects (e.g. career satisfaction) (Ng et al., 2005). However, Heslin (2005) avers that the different contexts of work life should also be taken into account. For the training period, perseverance and successful completion, as well as entry into a job or further training (e.g. higher vocational education), are important

objective indicators (Häfeli & Schellenberg, 2009). It is also important to consider if young people are finding adequate jobs in their professions or if they have to take any job they can get. Subjective indicators are, for example, training satisfaction or later work satisfaction.

2 Theoretical Background

2.1 Social Background

First, we look at how background factors, such as socioeconomic status or parental interest, migrant status, or region, influence career success early in one's career. Research results confirm the persistent effect of socio-demographic factors that shape school and professional success and, especially, the pathway to higher academic education (Becker & Schulze, 2013; Nägele et al., 2018). Specifically, in a comparison of different OECD countries (Organisation for Economic Co-operation and Development), NEET status is influenced by such background factors as the socioeconomic level of parents (status) and parental education (Carcillo & Königs, 2015). In British longitudinal studies, parental education and parental interest in a child's education play significant roles in predicting different educational paths, especially NEET status (Bynner & Parsons, 2002; Schoon & Lyons-Amos, 2017). In the Swiss TREE panel study, socioeconomic background, migrant status, gender, and region were influential for career success (Hupka-Brunner et al., 2015; Meyer, 2018). A German study shows disadvantages of migrant youth (especially the first generation) in a comparison with non-migrant youth, even when other influencing factors, such as social origin, are taken into account (Beicht & Walden, 2019). Finally, the influence of gender on career success has repeatedly been demonstrated. In most measures, existing studies show disadvantages for women (Meyer, 2018; Robson, 2010; Schoon & Lyons-Amos, 2017).

Another important predictor of NEET status (more generally, later career success) is the individual's educational achievement during compulsory schooling (Bynner & Parsons, 2002; Häfeli & Schellenberg, 2009). Educational achievement is influenced by socioeconomic background and migrant status, but even when these factors are controlled for, early school success is linked to later career success. This holds true also for students with disabilities or special educational needs (SENs). Early tracking into special classes—compared to inclusive schooling—has negative long-term effects on VET entry or self-esteem for students with matched abilities and family backgrounds (Eckhart & Sahli Lozano, 2014). However, in another Swiss study, apprentices from SEN backgrounds had a similar rate for labour market entry when compared with those of non-SEN backgrounds, even though they experienced a slower start (Hofmann & Häfeli, 2015). These groups completed a two-year Federal VET certificate, which seemed to be well-suited to the needs of disadvantaged youth.

2.2 Individual Disposition and Agency

The literature on career success shows the influence of a variety of personality characteristics, such as cognitive ability, personality traits, and learning motivation (Ng et al., 2005; Roberts et al., 2007).

An American study shows that disability—specifically, cognitive/learning disability, rather than physical disability—is strongly connected to disadvantaged pathways, mainly because it affects educational attainment and has effects consistently larger than several sociodemographic indicators (Erickson & MacMillan, 2018). In Switzerland, high Programme for International Student Assessment (PISA) reading literacy scores at the end of compulsory schooling are strong predictors for enrolling in tertiary education later (Hupka-Brunner et al., 2015; Meyer, 2018). However, results from the same dataset also show that even young people with low or exceptionally low reading literacy scores can successfully complete vocational education in the Swiss context (Buchholz et al., 2012).

Noncognitive skills (i.e. personality traits, such as conscientiousness, emotional stability, and openness) are just as predictive as cognitive ability or socioeconomic background for a range of outcomes, including educational attainment, labour market performance, and health status (Ng et al., 2005; Roberts et al., 2007). These general findings from meta-analytic studies are supported in a review on NEET research (Carcillo & Königs, 2015). In a German project, the important role of personality traits and vocational interests in securing success (satisfaction and dropout intention) in the first months of VET is demonstrated (Volodina et al., 2015). However, a Dutch study on vocational education cites no significant association between first-year dropout cases and, respectively, personality traits and cognitive skills (Eegdeman et al., 2018).

Self-efficacy and learning motivation are concepts related to certain personality traits, such as conscientiousness and emotional stability. School engagement and academic self-concepts (as indicators of self-efficacy) are associated with distinct pathways (such as NEET), according to an English study (Schoon & Lyons-Amos, 2017).

2.3 Factors Related to Vocational Training and Work

In addition to influences from social background or personality traits, situational factors related to vocational training and work can be important (Humphrey et al., 2007). These factors would be particularly relevant for the design and improvement of training. A first characteristic of the interaction between the person and work situation is the person-environment fit (PE fit). Results in a heterogeneous sample of French employees indicate that PE fit relates positively to job satisfaction and negatively to burnout and turnover intention (Andela & van der Doef, 2018). Among Swiss apprentices, perceived fit with the occupation

is a good predictor of job satisfaction and the intention to complete training (Nägele & Neuenschwander, 2015).

Various workplace characteristics (e.g. learning opportunities, autonomy, and skill variety) seem to have positive outcome effects (Humphrey et al., 2007). In a Swiss study on VET careers, learning opportunities—not socio-demographic factors—predicted engagement in higher vocational education (Nägele et al., 2018). Additionally, job resources (influence at work and opportunities for development) seem to protect against occupational turnover in the European nursing sector, whereas job demands (emotional demands and work-home-interference) are positively related to turnover (Van der Heijden et al., 2018). For Swiss apprentices with lower qualifications, skill variety relevant to the workplace and absence of stress while in vocational school contribute to staying employed after VET or continuing with further training (Hofmann & Häfeli, 2015; Stalder, 2012).

Finally, social support in the training environment is important, especially for young people with learning or other difficulties (Hofmann et al., 2014). It has been shown to influence competency development in vocational school (Neuenschwander et al., 2007), self-esteem (Linnehan, 2003), and future career satisfaction (Ng et al., 2005). Results of a Swiss study showed that the VET teacher's support was directly and indirectly related to career aspirations at the end of an apprenticeship, whereas the VET trainer's support influenced career aspirations only indirectly (Hofmann et al., 2014).

2.4 Hypotheses

The meta-analysis by Ng et al. (2005) showed that socio-demographic factors and "human capital" (e.g. training/work-related experience) tended to influence objective career success, whereas organisational support and stable personality traits were likely to predict subjective career success. Accordingly, Schoon and Lyons-Amos (2017) argued that if the demands of the developmental transitions are not matched to the capabilities of the individual or if they amplify previous difficulties, there can be a negative effect on mental health and well-being. This argument also refers to the concept of fit and perception of fit, a central theme in works on transition and training paths (Neuenschwander & Gerber, 2014). The fit between the requirements of training paths and the skills and interests of targeted youths is an important influencing factor on subjective and objective career success. Based on the literature cited, we assumed the following:

1. Socio-demographic factors (e.g. gender, parental education, migration status) have only a marginal influence on objective career success because earlier selection processes are more crucial.

2. Individual disposition (e.g. effort/concentration, life attitude) influence subjective career success.

3. Training and work conditions (e.g. skill variety, fit perception) have an influence on objective and subjective career success.

Figure 1 summarises the influencing factors relevant in the context of this study.

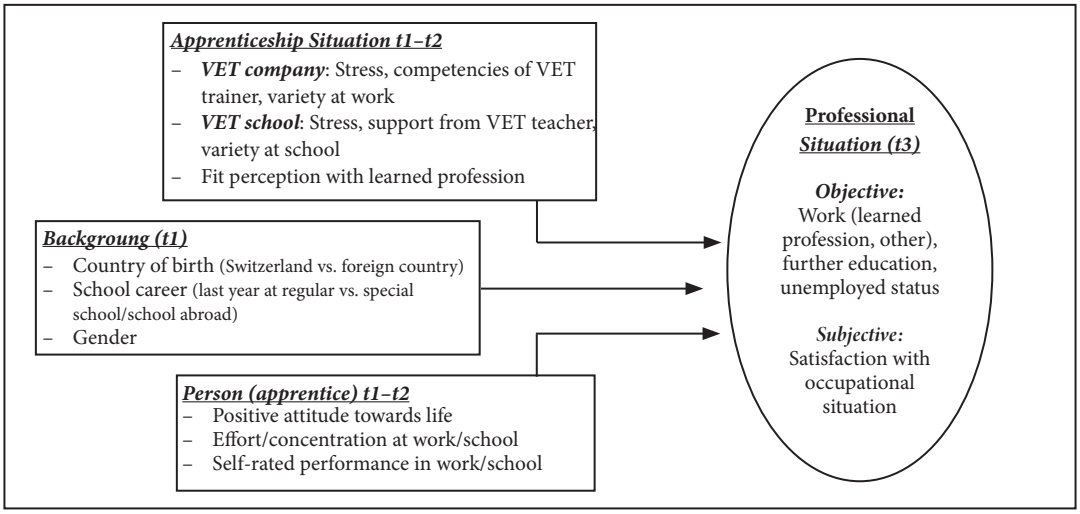


Figure 1: Relationships Between Background, Apprenticeship Situation, Persons, and Later Occupational Situation

3 Method

3.1 Participants and Procedures

Data were collected in the French- and German-speaking parts of Switzerland from four sectors of the federal VET certificate and practical training: Gastronomy, joinery, home economics, and building. These four sectors (out of approximately 50 occupations) were chosen for different reasons. They are numerically important (number of contracts) and some were already taken into account in previous studies, which allows for comparisons. The sectors vary in their content and in their gender composition. Furthermore, there is much concern about the number of early interruptions of the training in the building and gastronomy sector, which is an important question for the whole study. For our analyses, sectors were not taken into account because there were no indications of differences between sectors concerning

the question of *how* different factors relate to career outcomes. There were three measurement points. The first (Tt1) took place in autumn 2016 when participants were beginning their two-year vocational training programme. T1 took place at the Vocational School with 788 participants that responded to a written questionnaire in a classroom setting (everybody present on that day, thus response rate was 100%). They were asked about their backgrounds, career choices, and current apprenticeship situations. The researchers were present during data collection to provide assistance. T2 took place in spring 2018 at the end of the training programme (714 participants)[1]. The procedure was the same as that for t1. Apprentices were asked about their situations at school and companies; additionally, they were asked about their future perspectives. T3 followed in summer 2019, 10 months after training ended (424 participants)[2]. Each participant received a letter and questionnaire. Those who did not answer were contacted by phone and asked to respond orally to the questions. Again, they were asked about their current situations.

In this study, data of persons who participated either in all three measurement points, or at t1 and t3, or at t2 and t3, were included in the analyses (a total of 418 participants). The mean age of participants at t1 was 18.97 years (SD = 4.33); 40.4% were females. Regarding the qualification level, 81.6% were basic VET certificate learners and 18.4% were practical training learners. Sectors were represented as follows: 23.4%, joinery; 19.9%, building; 29.7%, gastronomy; and 25.4%, home economics. Additionally, 1.7% were from other training sectors.

3.2 Measures

Background

At t1, all participants were asked about country of birth, educational backgrounds of their parents, and school setting for each year of compulsory education (regular school, special school, or special classes).

Stress at the VET Company

Stress at the VET company was measured with a scale based on research by Semmer et al. (1999) consisting of five items (e.g. "Time-pressure at work is high", "I have to do difficult things that I have not yet learned"). Participants answered on a Likert scale ranging from 1 = "very rarely/never" to 5 = "very often". At t1, Cronbach's α was .75; at t2, it was .76.

1 Some apprentices prematurely dropped out of the VET, others entered because they were downgraded from the VET diploma, thus the composition of the sample changed.

2 The analysis of missing data shows no significant systematic dropouts regarding gender, former school career, migration background, sectors. This is also true for the scales that we used in our analyses with one exception: Perceived fit is higher for participants compared to non-participants (only answering at t1 or at t1 and t2).

VET Trainers' Competencies

Participants responded to four items on a scale measuring the competencies of the VET trainer, based on Neuenschwander et al. (2001) and adapted by Stalder et al. (2011). Sample items included "My VET trainer is able to explain things well" and "My VET trainer has time to answer my questions". Answers on a Likert scale ranged from 1 = "do not agree at all" to 4 = "fully agree". At t1, Cronbach's α was .82; at t2, it was .87.

Skill Variety at Work

Variety at work was measured with a scale developed by Prümper et al. (1995). The three items were as follows: "At work, I can learn a lot of new things", "My work varies", and "At work, I can use my knowledge and my skills fully". Answers on a five-point-scale ranged from 1 = "very rarely/never" to 5 = "very often". At t1, Cronbach's α was .69; at t2, it was .71.

Stress at the VET School

Stress while attending VET school was measured with a scale based on Semmer et al. (1999). It consisted of five items (e.g. "The subjects of the lessons change so fast"; "I have trouble keeping up"). Participants answered on a Likert scale ranging from 1 = "very rarely/never" to 5 = "very often". At t1, Cronbach's α was .81; at t2, it was .78.

Support From the VET Teacher

Support from the VET teacher was measured with one item based on a scale developed by Frese (1999) and adapted by Stalder et al. (2011). The introductory question was "How interested are the following persons in your training situation?", followed by a list of supportive persons, including the teacher. Answers on the Likert scale ranged from 1 = "not at all" to 4 = "very".

Skill Variety at School

Variety at school was measured with a scale developed by Prümper et al. (1995). The two items were as follows: "I can learn a lot in class" and "The lessons are varied". The answer format was a scale ranging from 1 = "very rarely/never" to 5 = "very often". Cronbach's α was .58 at t1 (r = .42) and .58 (r =. 41) at t2.

Perceived fit

The person–occupation fit was measured with five items from Neuenschwander et al. (2013) describing how well an occupation fits in terms of an individual's personality and abilities (e.g. "My apprenticeship training fits my personality"). The scale for responses ranged from 1 = "do not agree at all" to 4 = "fully agree". At t1, Cronbach's α'was .82; at t2, it was .84.

Effort/Commitment at Work

Effort and commitment at the company were measured with two items: "Good performance at the VET company is important to me" and "I show great effort at the VET company" (scale

adapted by Moser, 1997). The answer format was a scale from 1 = "do not agree at all" to 4 = "fully agree". Cronbach's α was .55 at t1 (r = .39) and .59 (r = .42) at t2.

Self-Rated Performance at Work
Self-rated performance at the VET company was evaluated with one item (i.e. "How do you assess your own performance at work?"); participants answered on a Likert scale ranging from 1 = "very bad" to 6 = "very good".

Effort/Concentration at School
Effort and concentration at school were measured with four items based on an adapted scale by Moser (1997). Sample items include "I show great effort at school" and "I concentrate fully at school". The answer format was a scale from 1 = "do not agree at all" to 4 = "fully agree". At t1, Cronbach's α was.76; at t2, it was .80.

Self-Rated Performance in School
To measure self-rated performance in VET school, we developed a two-item scale with the following: "How do you assess your own performance in occupation-specific knowledge classes?" and "How do you assess your own performance in general subject classes?". Answers on the Likert scale ranged from 1 = "very bad" to 6 = "very good.". Cronbach's α was .71 at t1 (r = .55) and .66 (r = .49) at t2.

Positive Attitude Towards Life
A positive attitude towards life was measured with four items based on a scale from Grob et al. (1991). Sample items include "Whatever happens, I can see the good side of it" and "I like to live". The Likert scale ranged from 1 = "totally wrong" to 5 = "totally true". At t1, Cronbach's α was .72; at t2, it was .77.

Objective Situation at t3
The former apprentices described their actual occupational situations by selecting one of several options (e.g. working in their learned profession[3], undertaking further education in the learned profession or another educational field, unemployed, etc.).

Satisfaction With the Situation at t3
Satisfaction with one's situation was measured with an adapted item based on Kammermann et al. (2009). The introductory question was different depending on the situation. For participants in work situations, it was "How satisfied are you with your situation at work?"; for participants pursuing further education, it was "How satisfied are you with your training situation?". For all others (NEET), it was "How satisfied are you with your situation?". Answers ranged from 1 = "extraordinarily unsatisfied" to 7 = "extraordinarily satisfied".

3 Learned profession means that the former apprentices work in the same field where their training took place.

For our analyses, we computed the means of the two scales (t1 and t2) and entered these new variables as independent variables. Means, standard deviations, and bivariate correlations between all included independent variables are presented in Table 1. Correlations between the variables were weak to moderate.

Table 1: Descriptions of and Correlations Between Independent Variables

		N	M	SD	1	2	3	4	5	6	7	8	9	10	11
1	Stress at work	417	2.66	.67	-										
2	Competencies of VET trainer	409	3.34	.57	-.12*	-									
3	Variety at work	417	3.92	.63	.02	.52**	-								
4	Stress at school	414	2.28	.74	.42**	.04	-.01	-							
5	Support from VET teacher	414	3.33	.71	.07	.11*	.18**	.10*	-						
6	Variety at school	417	3.94	.65	.00	.08	.29**	.01	.29**	-					
7	Perceived fit w/ learned profession	416	3.20	.51	-.01	.35**	.44**	.06	.23**	.25**	-				
8	Effort/commitment at work	418	3.44	.48	-.02	.33**	.44**	-.13**	.15**	.19**	.33**	-			
9	Performance at work (self-rated)	418	4.86	.64	-.05	.30**	.32**	.04	.15**	.13**	.36**	.21**	-		
10	Effort/concentration at school	407	3.18	.48	.11*	.17**	.29**	.01	.25**	.45**	.35**	.37**	.19**	-	
11	Performance in school (self-rated)	418	4.70	.66	.06	.13*	.22**	-.16**	.17**	.27**	.30**	.17**	.31**	.41**	-
12	Positive attitude towards life	415	3.98	.64	.02	.21**	.31**	.02	.16**	.21**	.32**	.21**	.30**	.31**	.31**

Note. *p < .05. ** p < .01; M = mean; SD = standard deviation; VET = vocational education and training.

4 Results

4.1 Occupational Situation After Apprenticeship

Ten months after their apprenticeships ended, around 80% of the former basic VET certificate learners and practical learners stated that they were either employed or continuing their education. Table 2 shows the situation of both groups in more detail.

Table 2: Occupational Situation at t3 (10 Months After Completion of Apprenticeship)

	Basic VET certificate learners		Practical training learners		Total	
	N	%	N	%	N	%
Employed in learned profession	123	36.6	38	49.4	161	39.0
Other employment	33	9.8	21	27.2	54	13.1
Further training in learned profession	89	26.5	6	7.8	95	23.0
Other further education	13	3.9	1	1.3	14	3.4
Unemployed	44	13.1	7	9.1	51	12.3
Other situation*	34	10.1	4	5.2	38	9.2
Total	336	100.0	77	100.0	413	100.0

Note. *e.g. military services, parenthood, illness; VET = vocational education and training.

When questioned, 39% of the former learners (both groups) were employed in their learned professions, approximately 26% were pursuing further education, and 12% were unemployed. The situations for former basic VET certificate learners and practical training learners differed significantly ($\chi 2(5) = 30.41$, $p < .001$). Former basic VET certificate learners were more often receiving further training (mostly in their learned professions) compared to former practical learners. Former practical learners were more often employed in their learned or other occupations. Additional analyses showed that 86.3% of the former VET certificate learners were working in the first labour market compared to only 49.1% of the former practical learners. The "unemployed" rate did not differ significantly (13% vs. 9%). In both groups, the number of people not in an occupational situation but also not unemployed ("other situation", such as parenthood or military service) was relatively high at 9%.

4.2 Influencing Factors on Later Occupational Situation (Objective Career Success)

To assess the association between background and apprenticeship situation and later occupational situation, the latter was used as the dependent variable in a multinomial logistic regression; the group with former learners working in their learned professions was the reference group (largest group; N = 132). For these analyses, we added VET certificate and practical learners, but only four groups were considered—employment in learned profession, other employment, further education in learned profession, and unemployed status—because the two other groups (other further education and other situation) were rather small and heterogenous.

Table 3 presents the comparison between the reference group and the remaining three other groups for the influence of background variables, apprenticeship situation, and individual disposition/agency.

Table 3: Predicting Occupational Situation After Apprenticeship (Multinomial Logistic Regression Analysis; Reference Group: Employed in Learned Profession, N = 132)[4]

	Other employment (N = 46)		Unemployed (NEET) (N = 45)		Further training in learned profession (N = 80)	
	B	Exp (B)	B	Exp (B)	B	Exp (B)
Background						
Gender (1 = female, 2 = male)	.76*	2.14	.36	1.44	.66*	1.94
Country of birth (1 = Swiss origin, 2 = broad)	.16x	1.18	-.09	.92	.21	1.24
School at 9th grade (1 = regular, 2 = special)	1.04*	2.82	.05	1.05	-.29	.75
Situation at the VET company						
Stress at work	-.17	.85	-.29	.75	-.39	.68
Competencies of VET trainer	-1.12**	.33	-.27	.76	-.38	.69
Variety at work	.46	1.58	.26	1.30	.39	1.47
Situation at the VET school						
Stress at school	-.14	.87	.50t	1.65	-.47t	.62
Support from VET teacher	.43	1.53	.05	1.05	-.04	.96
Variety at school	-.49	.61	.10	1.10	-.08	.92
Perceived fit with learned profession	.23	1.26	-.75t	.47	.23	1.26
Person						
Effort/commitment at work	-.32	.83	.13	1.13	.37	1.40
Performance at work (self-rated)	.26	1.30	-.17	.84	-.28	.76
Effort/concentration at school	-.11	.90	-.03	.97	.24	1.27
Performance in school (self-rated)	-.25	.78	.25	1.29	.30	1.35
Positive attitude towards life	-.01	.99	-.61*	.54	-.22	.80

Note. t p < .10, *p < .05, **p < .01; Pseudo-R^2(Cox & Snell) = .20; B = regression coefficient; Exp (B) = odds ratio[5]; VET = vocational education and training; NEET=not employed or in education.

First, we compared former learners who were working in their learned professions (reference group = 0) with former learners *working in another occupation* (=1). Regarding the *back-*

4 Parental education was included as an independent variable in our first analyses, but it reduced N substantially because of missing values. Moreover, it was not a significant predictor in the analyses.

5 Exp (B) can be interpreted in terms of the change of odds: If the value is greater than 1 then it indicates that as the predictor increases, the odds of the outcomes increase (conversely decrease when it is less than one, see also Cohen et al., 2003). E.g. males probability of further training is nearly twice as high compared to women.

ground variables, we found two significant associations: Being male as well as finishing the 9th grade in a special school increased the likelihood of working in an occupation other than the learned one. Regarding the *apprenticeship situation*, there was only one significant effect: Those who rated the competencies of the VET trainer more positively were less likely to work in another occupation. All other variables of the situation at the VET company and VET school had no significant influence. Moreover, there was no significant effect of person variables.

The second comparison concerned former learners who were working in their learned professions (reference group = 0) and former learners who were *unemployed* (=1). None of the *background* variables had a significant influence here. *Situation at the VET company* was not relevant either. However, there was one nearly significant effect of the *situation at the VET school*: Learners who experienced more stress while attending VET school were more likely to be unemployed 10 months after their apprenticeships ended ($p < .10$). Additionally, the perceived fit with the learned profession (rated at t1/t2) decreased the likelihood of being unemployed later ($p < .10$). One significant effect was found with the *person* variable: Those with more positive attitudes towards life were less likely to be unemployed 10 months after completing their apprenticeships.

Finally, we compared former learners who were working in their learned professions (reference group = 0) with former learners who were *undertaking further education in their learned professions* (= 1). Concerning the background variables, we found that being male increased the likelihood of such an undertaking. *Apprenticeship situation* had one nearly significant influence ($p = .06$): Learners who experienced less stress at VET school were more likely to undertake further education in their learned professions. None of the *person* variables reached statistical significance.

4.3 Influencing Factors for Later Satisfaction With the Situation (Subjective Career Success)

To assess the association between the training situation and future subjective career success, we chose the same independent variables as in the previous analyses and conducted analyses with the same sample. Model 1 includes the *background* variables, *apprenticeship situation*, and *person* variables. For Model 2, we added a dichotomous variable for the occupational situation 10 months after the apprenticeship ended (see Table 2, employed/further education groups [1–3] vs. unemployed/NEET [group 5]). Table 4 presents the results of the two linear regressions.

Table 4: Predicting Satisfaction With Situation 10 Months After Completion of Apprenticeship (Linear Regression, N = 300)

	Model 1		Model 2	
	ß	SE	ß	SE
Background				
Gender (1 = female, 2 = male)	-.16	.17	-.01	.14
Country of birth (1 = Swiss origin, 2 = abroad)	.03	.19	.01	.16
School at 9th grade (1 = regular, 2 = special)	-.02	.18	-.02	.15
Situation at VET company				
Stress at work	-.08	.14	-.10^{t}	.12
Competencies of VET trainer	-.06	.18	-.05	.15
Variety at work	.22**	.18	.23***	.15
Situation at VET school				
Stress at school	-.02	.13	.06	.11
Support from VET teacher	.04	.13	.04	.10
Variety at school	-.12^{t}	.15	-.10 ^{t}	.13
Perceived fit with learned profession	.12^{t}	.20	.04	.17
Person				
Effort/commitment at work	.06	.21	.06	.18
Performance at work (self-rated)	.03	.15	.02	.13
Effort/concentration at school	-.01	.23	-.01	.19
Performance in school (self-rated)	.10	.16	.13*	.13
Positive attitude towards life	.08	.14	.01	.12
Situation at t3 (0 = unemployed/NEET, 1 = employed/further education)			.53***	.20

Note. ^{t}p < .10, *p < .05, **p < .01, ***p < .001; ß = regression coefficient; SE = standard error.

The independent variables in Model 1 significantly explained satisfaction with the situation 10 months after the end of the apprenticeship (F (15) = 3.02, p < .001), but the overall explained variance was small (i.e. R^2 = .14; R^2_{cor} = .09). According to our analyses, skill variety at work seemed to be the most influential factor. apprentices rating variety at work at t1 and t2 more positively were also more satisfied with their situations at t3 (ß =.22, p < .01). Variety at school had an opposite effect (ß = -.12, p < .10): Apprentices who rated variety at VET school more positively were less likely to be satisfied with their situations at t3. Perceived fit with the learned profession also had a weak effect in the expected direction: Apprentices perceiving a better fit at t1 and t2 were more satisfied with their situations at t3 (ß = .12, p < .10).

Adding the situation at t3 as an independent variable to explain satisfaction at t3 led to a much better fit of the model (F (16) = 11.68, p < .001): R^2 is .36 (R^2_{cor} = .40). The situation at t3

had the strongest effect: Young workers or students pursuing further education were far more satisfied with their situations than persons of NEET status (ß = .53, p < .001). Even when controlling for this variable, variety of work at the VET company was still important: Those who perceived more variety at work during the apprenticeship were more satisfied with their situations later (ß = .23, p < .001). In addition, stress at the VET company during apprenticeship had a weak, negative effect on later satisfaction with the situation in Model 2 (ß = -.10, p < .10). Furthermore, the weak, negative effect of variety at VET school persisted in this model (ß = -.10, p < .10). Finally, we found that performance at VET school significantly influenced later satisfaction with one's situation (ß = .13, p < .05).

5 Discussion and Conclusions

5.1 Discussion

Looking at the careers of young people in low-threshold VET programmes in Switzerland, we found that 10 months after completing their apprenticeships, the majority (80%) were either employed or pursuing further education. Already, the heterogeneity of occupational pathways was evident, though these young people were in the early period of work life. In our study, we took a broad perspective regarding possible influences on the pathways, which included indicators of *objective* and *subjective* career success. We not only looked at social background, personal disposition, and agency, but we also included the training situation, thus expanding the socio-ecological model of human agency (Schoon & Lyons-Amos, 2017). While trying to become independent from their families, young people aged 16–20 might be especially receptive to workplace influences as well as those at the VET schools.

Results of the multinomial logistic and linear regressions showed a differentiated picture, rather than a uniform one, depending on the criteria for career success. For example, *background* factors of gender and school (9th grade) were associated with one's objective status after completion of the apprenticeship but not with subjective career success (hypothesis 1). As in other studies, young men, even at this early stage, demonstrated greater career success than women by continuing their education at the next level (Hupka-Brunner et al., 2015; Schoon & Lyons-Amos, 2017). The basis for this finding is probably related to the sectors in which males were working, where further education is generally expected and valued by the labour market. Their higher rates of occupational changes could be interpreted as the search for better prospects regarding pay (Müller & Schweri, 2009) or a temporary solution until the beginning of military service.

The influence of *school background* persisted even after completion of a standardised training programme. People from special classes and schools were less often pursuing further

education and more often employed in occupations other than their learned ones. These results confirm those of other studies: Early tracking and separation often continues after compulsory education (Eckhart & Sahli Lozano, 2014). Young people with SENs are often guided towards the secondary labour market, and apprenticeships take place in specialised institutions; these situations influence future career success (Hofmann & Schaub, 2014).

For the variables concerning *person disposition and agency* (hypothesis 2), we found only two plausible associations. A positive attitude towards life helps one avoid unemployment (or more generally, NEET) and a high self-rated school performance is associated with future satisfaction, which partly confirms the results of Schoon & Lyons-Amos (2017) and Volodina et al. (2015). However, "agency" seems to be less important for the group of learners with SENs than for other groups, probably because of a selection bias. Schoon and Lyons-Amos (2017) found that people with higher aspirations were less likely to be in NEET status but also less likely to be in VET or employed. Moreover, apprentices in low-threshold training situations were usually more dependent on their social networks; generally, other external factors (e.g. unemployment rate) could have played an important role at the time of entry to the labour market (Müller & Schweri, 2009).

As expected (hypothesis 3), *situational factors related to the VET company and school* showed a number of significant but sometimes weak associations with objective and subjective career success. So, competencies and support of the VET trainer were related to staying in the learned profession. The VET trainer probably acts as a role model and motivates this choice after apprenticeship. Surprisingly, the VET trainer's influence did not work for undertaking further education in our study, which contradicts findings of other studies (Hofmann et al., 2014; Nägele et al. 2018) but can be explained by the high correlation with other independent variables (e.g. skill variety) that mediate these associations. However, one of two predictors of further education was stress experienced at VET school, which seems to undermine the intention to continue one's education. In view of the higher intellectual demands to obtain a VET diploma, this is comprehensible. The other (even stronger) predictor is perceived fit with the learned profession, which is confirmed by other studies (Andela & van der Doef, 2018; Nägele & Neuenschwander, 2015). Another important factor—not for objective but for subjective career success—is skill variety at the VET company (Humphrey et al., 2007). Apprentices who rated skill variety highly were more likely to be satisfied with their later situations. Stalder (2012) also found that skill variety at the VET company was related to satisfaction and successful transition to the labour market, but skill variety at VET school did not have that effect. We found the same surprising result; apprentices who rated variety at VET school positively were less satisfied with their later work situations. It is likely that those who enjoyed being intellectually challenged missed this learning place, whereas more practically skilled young people did not.

5.2 Limitations and Further Research

Our findings should be interpreted in light of certain limitations. First, although we conducted our research with a special sample that was representative of young people with learning difficulties in four major fields of vocational training, this sample was not representative of young people in transition, nor did it represent young people with handicaps, learning disabilities, and other difficulties in general. Second, we were faced with the problem of missing responses at t3 (the labour market situation), which reduced our sample sizes, particularly for different groups needed for our comparisons. Under these circumstances, even large effect sizes might not reach statistical significance. Furthermore, there may be an effect on our results even though we analysed missing data and did not find indications of systematic drop-out. Third, we relied on self-reported data; some measures were based on single items (i.e. less stable than multi-item scales); a few scales showed only modest reliability. Finally, we observed only a short period for the transition to employment (i.e. the first 10 months). Though this is a crucial period, further research should follow the changes in transitions at later time points because former studies illustrated that the first years after training are not very stable (Hofmann & Häfeli, 2015).

5.3 Practical Implications

Though the results of many studies point to various background and personality factors as related to the career development of young people, our results indicate that the situations at the VET company and VET school might compensate for some young people, especially those with disadvantages or handicaps. First, VET trainers should be aware of their crucial role and how their interventions affect apprentices' self-perceptions and perceptions of their learned professions, which consequently influence motivation and career aspirations. It is important to be aware of apprentices with special needs in VET but it is also crucial not to underestimate these young people because opportunities at the VET company (e.g. skill variety) prepare them for future work situations and facilitate their transition.

The situation at the VET school (as a learning and social place) is equally important, especially for increasing permeability towards further training. Because stress at VET school seems to be a predicting factor, it is important to be aware of the aspirations and doubts of apprentices. Furthermore, stress at VET school is also related to a later NEET status, which points to the role of VET teachers in identifying young people at risk. Young people classified as NEET are of special concern. Even though this group is smaller (12%) in Switzerland than in most OECD countries (Carcillo & Königs, 2015), they show a number of problematic symptoms during their apprenticeships (e.g. lower perceived fit with learned professions, less positive attitude towards life) and are less satisfied with their situations after completing VET. Programmes with a daily structure and training opportunities are important for pre-

paring unemployed young people to enter the labour market. Assisting low-achieving youth in this effort remains challenging; the training company and VET school must support these vulnerable groups in their career development.

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References

Andela, M., & van der Doef, M. (2018). A comprehensive assessment of the person – Environment fit dimensions and their relationships with work-related outcomes. *Journal of Career Development*, *46*(5), 567–582. https://doi.org/10.1177/0894845318789512

Becker, R., & Schulze, A. (2013). *Bildungskontexte: Strukturelle Voraussetzungen und Ursachen ungleicher Bildungschancen* [Contexts of education: Structural conditions and causes of unequal educational opportunities]. Springer Verlag.

Beicht, U., & Walden, G. (2019). Transition to company-based vocational training in Germany by young people from a migrant background – The influence of region of origin and generation status. *International Journal for Research in Vocational Education and Training*, *6*(1), 20–45. https://doi.org/10.13152/IJRVET.6.1.2

Bergman, M. M., Hupka-Brunner, S., Keller, A., Meyer, T., & Stalder, B. E. (Eds.) (2011). *Youth transition in Switzerland. Results from the TREE panel study*. Seismo.

Bundesamt für Statistik. (2019). *Schweizerische Arbeitskräfteerhebung im 2. Quartal 2019: Arbeitsangebot* [Swiss labour force survey in the second quarter of 2019: Supply of labour] [Press release].

Buchholz, S., Imdorf, C., Hupka-Brunner, S., & Blossfeld, H.-P. (2012). Sind leistungsschwache Jugendliche tatsächlich nicht ausbildungsfähig? Eine Längsschnittanalyse zur beruflichen Qualifizierung von Jugendlichen mit geringen kognitiven Kompetenzen im Nachbarland Schweiz [Are academically weak youths really not ready for vocational training? A longitudinal analysis of vocational training trajectories of youths with low cognitive competencies in Switzerland]. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, *64*(4), 701–727. https://doi.org/10.1007/s11577-012-0186-1

Bynner, J. (2012). Policy reflections guided by longitudinal study, youth training, social exclusion, and more recently NEET. *British Journal of Educational Studies*, *60*(1), 39–52. https://doi.org/10.1080/00071005.2011.650943

Bynner, J., & Parsons, S. (2002). Social exclusion and the transition from school to work: The case of young people not in education, employment, or training (NEET). *Journal of Vocational Behavior*, *60*(2), 289–309. https://doi.org/10.1006/jvbe.2001.1868

Carcillo, S., & Königs, S. (2015). NEET youth in the aftermath of the crisis: Challenges and policies. *OECD Social, Employment and Migration Working Papers*, 164. https://doi.org/10.2139/ssrn.2573655

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences*. Routledge Taylor & Francis Group.

Eckhart, M., & Sahli Lozano, C. (2014). Der lange Schatten der schulischen Separation: Ergebnisse einer Längsschnittuntersuchung [The long shadow of school separation: Results of a longitudinal study]. In M. P. Neuenschwander (Ed.), *Selektion in Schule und Arbeitsmarkt* [Selection in school and in the labour market] (pp. 113–131). Rüegger.

Eegdeman, I., Meeter, M., & Van Klaveren, C. (2018). Cognitive skills, personality traits and dropout in Dutch vocational education. *Empirical Research in Vocational Education and Training*, *10*(1). https://doi.org/10.1186/s40461-018-0072-9

Erickson, G., & MacMillan, R. (2018). Disability and the transition to adulthood: A life course contingency perspective. *Longitudinal and Life Course Studies*, *9*(2), 188–211. https://doi.org/10.14301/llcs.v9i2.335

Fasching, H., Geppert, C., & Makarova, E. (2017). *Inklusive Übergänge. (Inter)nationale Perspektiven auf Inklusion im Übergang von der Schule in weitere Bildung, Ausbildung oder Beschäftigung* [Inclusive transitions. (Inter-)national perspectives on inclusion in the transition from school to further education, training, or employment]. Verlag Julius Klinkhardt.

Fouad, N. A., & Bynner, J. (2008). Work transitions. *American Psychologist*, *63*(4), 241–251. https://doi.org/10.1037/0003-066x.63.4.241

Frese, M. (1999). Social support as a moderator of the relationship between work stressors and psychological dysfuncioning: A longitudinal study with objective measures. *Journal of Occupational Health Psychology*, *4*(3), 179–192. https://doi.org/10.1037/1076-8998.4.3.179

Grob, A., Lüthi, R., Kaiser, F., Flammer, A., Mackinnon, A., & Wearing, A. J. (1991). Berner Fragebogen zum Wohlbefinden Jugendlicher (BFW) [Bernese questionnaire of well-being of youth]. *Diagnostica*, *37*(1), 66–75. https://www.researchgate.net/profile/August-Flammer/publication/232538901_Berner_Fragebogen_zum_Wohlbefinden_Jugendlicher_BFW_The_Bern_Subjective_Well-Being_Questionnaire_for_Adolescents_BFW/links/542427a40cf26120b7a71fb9/Berner-Fragebogen-zum-Wohlbefinden-Jugendlicher-BFW-The-Bern-Subjective-Well-Being-Questionnaire-for-Adolescents-BFW.pdf

Häfeli, K., & Schellenberg, C. (2009). *Erfolgsfaktoren in der Berufsausbildung bei gefährdeten Jugendlichen*. Schweizerische Konferenz der kantonalen Erziehungsdirektoren.

Heslin, P. A. (2005). Conceptualizing and evaluating career success. *Journal of Organizational Behavior*, 26, 113–136. https://doi.org/10.1002/job.270

Hofmann, C. (2019). Lernende in Übergangssituationen im niederschwelligen Ausbildungsbereich: Einschätzungen zur Berufswahl und ersten Erfahrungen im Lehrbetrieb und in der Schule. Sonderpädagogische Förderung heute. In C. Lindmeier, H. Fasching, B. Lindmeier & D. Sponholz (Eds.), *Inklusive Berufsorientierung und berufliche Bildung - Aktuelle Entwicklungen im deutschsprachigen Raum* (pp. 358–368). Beltz Juventa.

Hofmann, C., & Häfeli, K. (2015). Übergang in den Arbeitsmarkt nach einer Attestausbildung. In K. Häfeli, M. P. Neuenschwander & S. Schumann (Eds.), *Berufliche Passagen im Lebenslauf* (pp. 189–218). VS Verlag für Sozialwissenschaften.

Hofmann, C., & Müller, X. (2017). Verzögerter Einstieg, aber Zufriedenheit mit zweijähriger Ausbildung. Befragung von Lernenden bei Ausbildungsbeginn zum Übergang in die Ausbildung und zu ersten Erfahrungen in Schule und Lehrbetrieb. *Schweizerische Zeitschrift für Heilpädagogik*, *23*(10), 40–47.

Hofmann, C., & Schaub, S. (2014). "Supported Education" im ersten Arbeitsmarkt: Ausbildungssituation und berufliche Perspektiven. *Schweizerische Zeitschrift für Heilpädagogik*, *20*(10), 25–32. https://www.hfh.ch/sites/default/files/old/documents/Dokumente_FE/B.23_Hofmann_2014_Supported_SZH.pdf

Hofmann, C., & Schellenberg, C. (2019). Der Übergang Schule – (Aus-)Bildung – Beschäftigung in der Schweiz. Ein Überblick mit Fokus auf die berufliche Ausbildung. In C. Lindmeier, H. Fasching, B. Lindmeier & D. Sponholz (Eds.), *Inklusive Berufsorientierung und berufliche Bildung – Aktuelle Entwicklungen im deutschsprachigen Raum* (1st ed., pp. 194–219). 2. Beiheft Sonderpädagogische Förderung heute. Beltz.

Hofmann, C., Stalder, B. E., Tschan, F., & Häfeli, K. (2014). Support from teachers and trainers in vocational education and training: The pathways to career aspirations and further career development. *International Journal for Research in Vocational Education and Training*, *1*(1), 1–20. https://doi.org/10.13152/IJRVET.1.1.5

Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: A meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology*, *92*(5), 1332–1356. https://doi.org/10.1037/0021-9010.92.5.1332

Hupka-Brunner, S., Scharenberg, K., Meyer, T., & Müller, B. (2015). Leistung oder soziale Herkunft [Performance or social origin]? In K. Häfeli, M. P. Neuenschwander & S. Schumann (Eds.), *Berufliche Passagen im Lebenslauf* [Occupational transitions in the life course] (pp. 243–276). VS Verlag für Sozialwissenschaften.

Hupka, S., & Stalder, B. E. (2011). Jeunes migrantes et migrants à la charnière du secondaire I et du secondaire II [The situation of young migrants making the transition from lower to upper secondary education]. In M. M. Bergman, S. Hupka-Brunner, K. A. T. Meyer & B. E. Stalder (Eds.), *Transitions juvéniles en Suisse. Résultats de l'étude longitudinale TREE* [Youth transitions in Switzerland: Results from the TREE panel study] (pp. 183–200). Seismo.

Kammermann, M. (2010). Job or further training? Impact of the Swiss basic federal vocational education and training (VET) certificate on the careers of low achieving young people. *Education + Training*, *52*(5), 391–403. https://doi.org/10.1108/00400911011058334

Kammermann, M., Hofmann, C., & Hättich, A. (2009). *Forschungsprojekt Arbeitsmarktfähigkeit und zweijährige berufliche Grundbildung. Skalendokumentation zur Ersterhebung bei den Lernenden.* Hochschule für Heilpädagogik.

Linnehan, F. (2003). A longitudinal study of work-based, adult–youth mentoring. *Journal of Vocational Behavior*, *63*(1), 40–54. https://doi.org/10.1016/S0001-8791(02)00012-X

Meyer, T. (2018). Von der Schule ins Erwerbsleben: Ausbildungs- und Erwerbsverläufe in der Schweiz [From school to work: Educational and employment trajectories in Switzerland]. *Social Change in Switzerland*. FORS.

Moser, U. (1997). *Messinstrumente zu Unterricht und Leistungsbereitschaft in TIMSS+. Projektdokumentation* [Instruments to measure education and achievement in TIMSS+. Project Documentation]. Amt für Bildungsforschung der Erziehungsdirektion.

Müller, B., & Schweri, J. (2009). Berufswechsel beim Übergang von der Lehre in den Arbeitsmarkt [Change at the transition from apprenticeship to work]. *Schweizerische Zeitschrift für Bildungswissenschaften*, *31*(2), 199–227. https://doi.org/10.24452/sjer.31.2.5093

Nägele, C., & Neuenschwander, M. P. (2015). Passt der Beruf zu mir [How is the fit between the occupation and myself]? In K. Häfeli, M. P. Neuenschwander & S. Schumann (Eds.), *Berufliche Passagen im Lebenslauf* [Occupational transitions in the life course] (pp. 49–74). VS Verlag für Sozialwissenschaften.

Nägele, C., Neuenschwander, M. P., & Rodcharoen, P. (2018). Higher education in Switzerland: Predictors of becoming engaged in higher vocational or higher academic education – The role of workplace factors. *International Journal for Research in Vocational Education and Training*, *5*(4). https://doi.org/10.13152/IJRVET.5.4.2

Neuenschwander, M. P., Herzog, W., & Holder, M. (2001). *Schulkontext und Identitätsentwicklung im Jugendalter* [School context and identity development in youth]. Schlussbericht. Universität Bern: Institut für Pädagogik.

Neuenschwander, M., Frey, M., & Gasser, L. (2007). *Übergang in die Sekundarstufe II und Wirkungen der Berufsbildung* [Transition into upper secondary education and effects of vocational education]. Jacobs Center for Productive Youth Development, Universität Zürich.

Neuenschwander, M. P., Hermann, M., Frank, N., & Faschinger, S. (2013). *Berufsbildungsentscheidungen beim Übergang in den Arbeitsmarkt BEN. Dokumentation des Fragebogens Lehrlings- und Personalverantwortliche* [Vocational decisions at the transition into the labour market. Documentation of questionnaire for managers of vocational training and human ressoures]. Pädagogische Hochschule FHNW: Zentrum Lernen und Sozialisation.

Neuenschwander, M. P., & Gerber, M.-S. (2014). Schulische Vorbereitung auf die berufliche Sozialisation im Lehrbetrieb [School preparation for the occupational socialisation in the training firm]. *Unterrichtswissenschaft*, *42*(3), 244–260.

Ng, T. W. H., Eby, L. T., Sorensen, K. L., & Feldman, D. C. (2005). Predictors of objective and subjective career success: A meta-analysis. *Personnel Psychology*, *58*(2), 367–498. https://doi.org/10.1111/j.1744-6570.2005.00515.x

Prümper, J., Hartmannsgruber, K., & Frese, M. (1995). KFZA–Kurz-Fragebogen zur Arbeitsanalyse [Short questionnaire for the analysis of work]. *Zeitschrift für Arbeits- und Organisationspsychologie*, *39*(3), 125–131. https://people.f3.htw-berlin.de/Professoren/Pruemper/instrumente/KFZA-Skalenkonstruktion.pdf

Roberts, B. W., Kuncel, N., Shiner, R., Caspi, A., & Goldberg, L. (2007). The power of personality: The comparitive validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives in Psychological Science*, *2*(4), 313–345. https://doi.org/10.1111/j.1745-6916.2007.00047.x

Robson, K. (2010). The afterlife of NEETs. In P. Attewell & K. S. Newman (Eds.), *Growing gaps: Educational inequality around the world* (pp. 185-209). Oxford University Press on Demand.

Sacchi, S., & Meyer, T. (2016). Übergangslösungen beim Eintritt in die Schweizer Berufsbildung: Brükkenschlag oder Sackgasse [VET entry in Switzerland via "bridging solutions": Stepping stone or dead end]? *Swiss Journal of Sociology*, *42*(1), 9–39. https://doi.org/10.1515/sjs-2016-0002

Schmid, E. (2020). Upper secondary education for youth at risk: A comparative analysis of education and training programmes in Austria, Norway, Sweden and Switzerland. *International Journal for Research in Vocational Education and Training*, *7*(1), 21–44. https://doi.org/10.13152/IJRVET.7.1.2

Schoon, I., & Lyons-Amos, M. (2017). A socio-ecological model of agency: The role of psycho-social and socioeconomic resources in shaping education and employment transitions in England. *Longitudinal and Life Course Studies*, *8*(1), 35–56. https://doi.org/10.14301/llcs.v8i1.404

Semmer, N. K., Zapf, D., & Dunckel, H. (1999). Instrument zur Stressbezogenen Tätigkeitsanalyse (ISTA) [Instrument for stress-related work analysis]. In H. Dunckel (Ed.), *Handbuch psychologischer Arbeitsanalyseverfahren* [Handbook for psychological measures of work analysis] (pp. 179–205). vdf Hochschulverlag an der ETH.

Stalder, B. E. (2012). School-to-work transitions in apprenticeship-based VET systems: The Swiss approach. In S. Billett, G. Johnson, S. Thomas, C. Sim, S. Hay & J. Ryan (Eds.), *The experience of school transitions: Policies, practice and participants* (pp. 123–139). Springer.

Stalder, B. E., Meyer, T., & Hupka-Brunner, S. (2011). TREE project documentation. In M. M. Bergman, S. Hupka-Brunner, A. Keller, T. Meyer & B. E. Stalder (Eds.), *Youth transitions in Switzerland: Results from the TREE panel study* (pp. 66–87). Seismo.

Stalder, B. E., & Nägele, C. (2011). Vocational education and training in Switzerland: Organisation, development and challenges for the future. In M. M. Bergman, S. Hupka-Brunner, A. Keller, T. Meyer & B. E. Stalder (Eds.), *Youth transitions in Switzerland: Results from the TREE panel study* (pp. 18–39). Seismo.

Van der Heijden, B. I. J. M., Peeters, M. C. W., Le Blanc, P. M., & Van Breukelen, J. W. M. (2018). Job characteristics and experience as predictors of occupational turnover intention and occupational turnover in the European nursing sector. *Journal of Vocational Behavior*, *108*, 108–120. https://doi.org/10.1016/j.jvb.2018.06.008

Volodina, A., Nagy, G., & Köller, O. (2015). Success in the first phase of the vocational career: The role of cognitive and scholastic abilities, personality factors, and vocational interests. *Journal of Vocational Behavior*, *91*, 11–22. https://doi.org/10.1016/j.jvb.2015.08.009

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Visualising the Intended Practical Doing: Future-Oriented Movements in Swedish Vocational School Workshop Settings

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Abstract

Context: This article focuses on teaching and learning processes in a vocational classroom in Swedish vocational education. There are few studies within the field of vocational education that have a focus on how vocational learning is done in interaction in the vocational classroom/workshop, and what vocational learning content is displayed in the interaction between teacher and student, and thus made possible to learn. This article aims to fill this gap by exploring the future-oriented movements that take shape when a vocational teacher and vocational students negotiate how a practical task could, and should, be handled and solved in vocational teaching situations in vocational plumbing school workshop settings. An increased understanding of these processes can help to improve the actual teaching of a specific subject content to support students in their vocational learning, aiming for learning a professional trade.

Methods: The data consist of video recorded lessons from the Sanitary, Heating and Property Maintenance Programme in Swedish upper secondary school. Through concrete empirical examples from video recorded lessons the article explores the interaction between teachers and students in vocational school workshop settings using CAVTA. CAVTA is based on Conversation Analysis (CA) and Variation Theory (VT) and is a theoretical and methodological framework that can be used together and integrated to reach understanding of both how- and what-aspects of the learning process in practice, when analysing teaching and interaction.

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Findings: Findings show how aspects concerning a specific vocational learning content that revolves around a vocational practical doing compete for the space with a vocational learning content of a more general nature. These general objects of learning are also related to work-specific vocational learning and knowledge in relation to the future profession, but on a more general level than the task specific vocational knowledge. Altogether, this illuminates how different layers of work-specific vocational learning are made visible in the interaction, and how they mutually contextualise each other in the here and now.

Conclusion: This article illustrates that the specific and the general vocational learning content can complement each other and open up for a more in-depth vocational learning. In conclusion, this article emphasises the importance for vocational teachers to develop teaching strategies to navigate between helping the students in their problem solving here and now, and contextualising the specific vocational learning content and making vocational learning relevant for future vocational occupation and working life.

Keywords: Vocational Learning, Vocational Teaching, Vocational Education and Training, VET, CAVTA, Interaction

1 Introduction

A central feature of vocational education is the interaction that takes place between teachers and students, which can contribute to the development of the specific vocational content of the education and the profession (Andersson, 2019). Despite the proven importance of this interaction for students' learning and the development of vocational education, there is still a lack of studies that focus on the interaction that takes place between teachers and students when students learn a specific content in vocational education (Asplund & Kilbrink, 2020; Schaap et al., 2012). In an ongoing research project, we shed light on precisely these issues by studying what happens when a teacher and students interact about a specific learning content in vocational education. In our data we can see that when students and teachers negotiate how a practical task should be handled and solved in a vocational teaching situation, they do not only orient themselves towards the practical doing here and now, but a lot of attention is also directed towards what has already been done, and what is to be done next. A concept used in conversational analytical research to describe these movements in time and space is longitudinal orientation (Sahlström, 2011). According to Sahlström et al. (2010), orientations towards a longitudinally established content constitute one of the core aspects that enables a situation to be described as a learning situation, not only analytically, but also for the participants there and then. These longitudinal orientations towards a specific content are thus very common in the data we have collected on teachers' and students' interaction in vocational education, and thus constitute central elements in the vocational education we have studied.

In this article, we will further analyse some of the sequences from our material, with the aim of increasing our knowledge and understanding of the future-oriented movements in the interplay between teacher, students and a vocational subject content.

1.1 Research on Longitudinal Aspects in VET

In previous research on learning in vocational education one research strand is related to how learning in vocational education can be relevant for a future working life. Within this research, it has been emphasised that vocational education is not only about learning to perform a profession in a purely practical way, but that there is also a vocational content that is linked to a future professional competence to adequately meet the market's demands (Andersson, 2019; Nore, 2015; Tuomi-Gröhn & Engeström, 2003; Kilbrink & Bjurulf, 2013; Nylund & Virolainen, 2019). Furthermore, previous studies have highlighted different kinds of learning and knowledge within vocational education, where the specific vocational learning content is one part, and learning for life in general is another (Baartman & de Bruijn, 2011; Illeris, 2009; Kilbrink et al., 2014; Lindberg, 2003). These general competences include skills like arriving on time, being a loyal employee who can work together with others, being able to reflect on how specific practices may be integrated into other contexts, and having knowledge of social order (Baartman et al., 2018; Eiríksdóttir & Rosvall, 2019). However, few studies focus on how the learning processes in vocational education are set into play when teachers and students interact in relation to learning a specific vocational learning content (Asplund & Kilbrink, 2020; Kilbrink et al., 2021; Schaap et al., 2012).

Many studies that examine vocational education and its practice tend to focus on general pedagogical issues such as how meaning is negotiated between teachers and students and what communicative strategies teachers and students use when interacting with each other in teaching situations (Khaled et al., 2016; Schaap et al., 2017; Öhman, 2018; Öhman & Tanner, 2017). Chan (2017), for example, focuses on the role of imitation in learning occupational skills through the mutual relationships between learners and "model", and de Saint-Georges and Filliettaz (2008), when examining the interactions in which apprentices engage, show how individual learning in vocational education is also a collective process in that it takes place in interaction with others.

What these previous research studies have in common is that they show the complexity of the learning processes students are involved in when they interact with each other and/or their teachers in different teaching situations. What many of these studies also show, although the focus in each study may be on other aspects, are the movements in time and space that are initiated by teachers and students in the interaction. Kilbrink and Asplund (2018) for example, show how a VET teacher, when instructing a student in a plumbing workshop lesson, relates to what has been done previously in a teaching situation, as welding instructions are

given, thus using this movement in time and space as a resource in the teaching situation (see also Jakonen, 2018) when instructing the student how to weld (eg. Sakai et al., 2014). Focusing on how knowledge transits between individuals across time and space, de Saint-Georges and Filliettaz (2008) emphasise the role of close guidance as the way to untie the knots in apprentices' vocational learning trajectories. In their study, de Saint-Georges and Filliettaz show how apprentices can take the role of "trajectory managers", re-figuring explanations given to them by their teacher in the past when helping their peers – here and now – conducting a task that their peers experience as difficult.

In another study, Filliettaz et al. (2015) examine the role and place of guidance and mentoring in vocational education. Conceptualising mentoring practices as interactional accomplishments, Filliettaz et al. demonstrate that guidance is a complex process and that it can be dynamically combined and evolve in time when mentors and students are doing guidance, thus highlighting the importance of interactional competences for workers when "doing guidance".

However, a large part of previous research on the interaction between teachers and students in vocational education has focused on workplace-based teaching and learning activities, and on the whole, there are few studies that direct a special interest towards the specific content to be taught and learned in vocational education. Besides the work of scholars such as Asplund and Kilbrink (Asplund & Kilbrink, 2018, 2020; Kilbrink & Asplund, 2018), Gåfvels (2016) and Öhman (2018) who highlight specific dimensions of vocational learning, emphasising how it is often taught in interaction between teacher and student, and including an aspect of handicraft as well as a concrete doing and practical experience, there are few studies within the field of vocational education that have a focus on how vocational learning is done in interaction in the vocational classroom/workshop, and what vocational learning content is displayed in the interaction between teacher and student, and thus made possible to learn.

Not least, there is a lack of research that explores the movements in time and space that are set into play when teachers and students interact about a specific learning content in vocational plumbing education. Hence, there is a need for studies that direct a special focus on what happens when these movements are initiated here and now in interaction and what learning content is made relevant in these situations. An increased understanding of these processes can help to improve the actual teaching of a specific subject content to support students in their vocational learning, aiming for learning a professional trade (Asplund & Kilbrink, 2018, 2020; Lucas et al., 2012). Hence, the aim of this study is to increase this knowledge and understanding of the future-oriented movements in the interplay between teachers, students and a vocational subject content. We will study longitudinal orientations towards a specific content based on the following research questions: 1) *How is a common understanding of what is to be done and learned in vocational plumbing education established in the interaction between a teacher and students? 2) What content is made relevant in these processes?*

2 Theoretical and Methodological Approach

In the article, we will use Conversational Analysis together with Variation Theory as a tool to analyse the interaction that takes place in the classrooms between teachers and students. When we combine these theories, we use the abbreviation CAVTA (Conversation Analysis and Variation Theory Approach). We have previously used these theories together in analyses of teaching and learning processes in schools (Asplund & Kilbrink, 2018, 2020; Kilbrink & Asplund, 2018, 2020).

2.1 Conversation Analysis

The starting point for combining Conversational Analysis with Variation Theory into CAVTA is the now established view in contemporary conversational analytical research that learning is something that is done in interaction between people, and between people and artifacts in their specific surrounding (Melander & Sahlström, 2010; Sahlström, 2011). The approach intersects with the learning theories that describe learning as a change in participation (Lave, 1993; Säljö, 2005). The conversation analysis is thus interested in how people construct meaning and understanding in interaction with each other and artifacts in the surrounding context, and what communicative resources (both verbal and embodied) are used in the interaction (Drew & Heritage, 2006; Goodwin, 2000, 2006; Schegloff, 2007).

A fundamental principle in the conversational analytical approach is participants' work to establish an understanding of each other's actions when they interact with each other. In concrete terms, this means that participants themselves, when participating in interaction, analyse each other's actions, there and then, and show their understanding of these actions turn by turn. The participants' work of demonstrating their mutual understanding of each other thus gives the conversation analyst the opportunity to anchor the analysis empirically – i.e. in the participants' demonstrated understanding of the interaction. This so-called emic perspective (Duranti, 1997) which is sought in both data collection and the analytic work means that the analysis only focuses on what the participants themselves orient to and which actions and activities the participants themselves construct and make relevant in the interaction here and now. Accordingly, as a conversation analyst you cannot make any claim to make any statements concerning what conversation participants think or what they understand, nor what they don't understand, because the core of the Conversation Analysis approach is precisely to study phenomena from an "inside perspective" (eg. Sahlström, 2011).

In this article, we focus on the encounter between teacher, student and a specific content to be learned, and it is in this meeting that these two perspectives – Conversational Analysis and Variation Theory – can be used together, simultaneously and integrated in CAVTA in our analysis of the interaction that will be studied.

2.2 Variation Theory

In Variation Theory, the specific focus on the learning content is central. The learning content in focus in teaching is called *the object of learning*, and it can differ between what the teacher aimed for (intended object of learning), what was possible to learn in the teaching/learning situation (enacted object of learning) and what the students actually learned (lived object of learning) (Lo, 2012; Marton & Tsui, 2004). In our study, we solely focus on what is made possible to learn in the enacted teaching/learning situation – hence, *the enacted object of learning*. Furthermore, the object of learning has a direct and an indirect aspect, related to how the learning content should be learned, i.e. what ability (indirect aspect) is related to the learning content (direct aspect). For example, the object of learning can be about understanding something (for example how you should weld) when someone else shows you, or about being able to perform something on your own (for example put a weld). In the example, welding is constant as the direct aspect, while the indirect aspects (understanding or performing) differ (Asplund & Kilbrink, 2020; Kilbrink & Asplund, 2020).

One important aspect of teaching, emphasised in Variation Theory, is to make critical aspects (things you need to discern in order to learn the object of learning, see Pang & Ki, 2016) visible to the learners by using different patterns of variation (Lo, 2012; Marton & Tsui, 2004; Marton, 2015). *Contrasting*, as a pattern of variation is related to comparing different values of critical aspects, or to see how something could be done or not (e.g. you can hold like this when welding, but not like this, see Kilbrink & Asplund, 2020); and *generalisation* as a pattern of variation is about highlighting different kinds and aspects of a phenomenon (there are for example different kinds of triangles) or ways of doing things (e.g. you can hold like this, or like this when welding, see Kilbrink & Asplund, 2020).

Hence, critical aspects can vary (dimensions of variation) and every value of the dimension of variation is a critical feature. If colour is a critical aspect, blue can be an example of a critical feature of the critical aspect. We have chosen to call what the teacher aims for ("the target values of critical aspects", Pang & Ki, 2016, p. 324) in their teaching the *targeted critical feature* (Kilbrink & Asplund, 2020). When several critical aspects are present and varied in the teaching situation at the same time, the pattern of variation is *fusion*. Lo and Chik (2016) elaborate the concept of fusion to concern internal and external horizons of fusion, where internal horizons of fusion concern how the critical aspects of the object of learning interrelate, while external horizons of fusion are about how the object of learning and its critical aspects relate to an external context (compare also Kilbrink & Asplund, 2018 concerning a vocational example).

When combining Variation Theory with CA in CAVTA, we can analyse in great detail how the enacted object of learning and its critical aspects and features are made visible (or not) by the use of different patterns of variation in the interaction between the teacher and learner(s).

3 Data

The data collection for this study consists of video recorded lessons from the Sanitary, Heating and Property Maintenance Programme, which is a technical vocational programme in Swedish upper secondary school. The programme aims to educate future plumbers, and we have recorded the teaching that was conducted in school workshop sessions at two different occasions in the same class for a total of 4 hours and 36 minutes. In this article, we have chosen two teaching situations from the programme where future-oriented movements are set into play when the teacher and students interact in relation to a vocational subject content.

In Sweden, the vocational teacher has the responsibility for creating conditions for vocational learning for groups of up to 30 students, with limited access to tools, machines, space and material, which often creates situations where students in the same class are engaged in different tasks in the school workshop (Kilbrink et al., 2021). This was also the case when we visited the Sanitary, Heating and Property Maintenance Programme. The students in the Heating, Ventilation and Sanitation Engineering programme were engaged in various tasks during the period we visited the class. Scattered in two large workshop classrooms, and in different work booths, the students worked with elements such as assembling water heaters, toilet installations and boilers. The vocational teacher went from room to room to help students in their practical work. For video recording purposes, we used two cameras; one camera recorded two focus students (one at a time) and the other camera recorded the vocational teacher and his interaction with the students during the lessons.

When analysing the empirical data, first, the research group (the authors of this article) watched the films of the recorded lessons several times, both individually and together in the research group. After having categorised multiple clips in relation to longitudinal references in time, mainly focusing on a future doing, the analytic decisions that the authors made were presented, discussed and explored in several data sessions, until we agreed upon choosing two examples for a closer, in-depth analysis for this article. This is a common analytic procedure within interactional studies (Stevanovic & Weiste, 2017).

In line with the CA approach that rests on a "methodological and epistemological naivety" (Schegloff, 1997, p. 185) we have aimed to ground this microanalysis from the participants' points of view. When identifying which actions and which learning content the participants themselves orient to as relevant at a specific point in the interaction, and to show this in a convincing way in the analysis, we have used the "proof procedure" method (Sacks et al., 1974) that has been developed within CA, which takes into account the viewpoints of the participants. This perspective involves the use of the participants' demonstrated interpretations of each other's actions as a resource in the analysis and as a means of enabling readers to judge the claims of the analyst, thus striving for the emic perspective mentioned above. In relation to the examples in this article, the evidence used to construct our analysis of what some

bit of conduct is doing will be located in the data itself, and presented after each example below in a way that enables the reader to follow our analysis turn by turn (eg. Sidnell, 2013).

The chosen examples have been transcribed according to CA-conventions (eg. Hepburn & Bolden, 2013) and analysed on a micro level using CAVTA, described above. Thereby, we made a close and detailed analysis of the interaction (mainly based on CA-tools) and the learning content made visible in the interaction (mainly based on tools from Variation Theory). Through the analysis, we can reach an understanding of which content is made relevant in the interaction and how it is oriented to here and now, but also in relation to the future (and the past). In this article, we have an explicit focus on the interaction that takes place in relation to the enacted object of learning, and we will therefore not discuss what the teacher aimed for or what the students actually learned. We follow the ethical principles stated by the Swedish research council (Vetenskapsrådet, 2017). For example, all participants (the teacher and the students) have been informed about the study and have given their written consent to participate, and the data reported from the study has been anonymised.

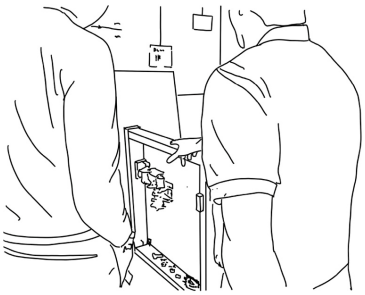
4 Results and Analysis

4.1 The Importance of Following an Instruction

In our first example, one of the students, John, has the task of assembling an underfloor heating system in a smaller stand, and at the beginning of one of the work sessions he turns to his teacher (T) to ventilate what he is to do:

Example 1A: *the most important lore*

1. John: where should I start (.) with putting together rails?
2. T: either you start screwing together



3. John: the actual:
4. T: distributor
5. John: the distributor yes
6. T: here you have pipe bending consoles ((takes consoles))then
7. John: bending consoles yes
8. T: mm and then you have to look at the instruction papers to
9. ((lifts a card board from the floor)) here (.)
10. you have this, right ((takes up papers, looks at them))
11. how this should be e: assembled
12. John: yes
13. T: that's what you should start with ((gives the papers to
14. the student))
15. John: I guess that's how (x) has done it I guess
16. T: mm (4.8) that is the most important lore that↑
17. John: °yes:°
18. T: to read the manual ((looks at the student))
19. John: exa:ctly (.) should it look like this



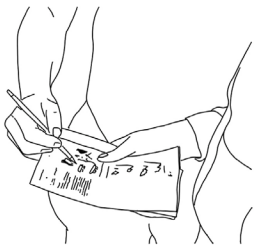
20. T: yes
21. John: although with two that is
22. T: although with two yes (.) because we only have two loops
23. John: yes
24. T: and then there you see that ((lays the card board on the
25. floor, puts on glasses and points with a pen to the
26. paper)) °there we have the pump° you see (.) and that's



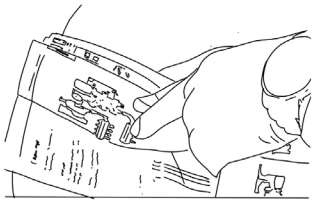
27. the inflow
28. John: mhm
29. T: o:ut
30. John: mhm
31. T: but (.) there they have put (2.4)>>
32. >>[ad [adjustment e:[distributor]
33. John: [thi:[s: [ye:s] you mean because with
34. the:(.) we:ll or what it now beco- (1.2) shift wi:th
35. T: you can adj[ust with-
36. John: [this one should be on the return



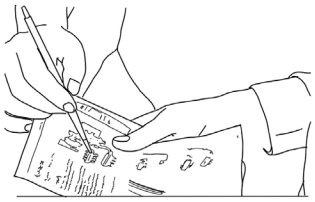
37. T: adjust the loops (.) °but here they have put in on the
38. the inflow°



39. John: >yes I thought that< because it should be on this



40. T: yes (.) but you will put it you do it as in the manual



41. John: so now I will put e:
42. T: now you put it on the in[flow
43. John: [injustment(.)inflow?



44. T: mm
45. John: oke:y
46. (2.4)
47. T: apart from that you've got everything
48. John: yes ((looks at the manual, then at the work place))
49. can I also bend the pipes to: ((points to the paper))
50. T: yes
51. John: the actual inflow
52. T: the assembling in yes
53. John: and the return then
54. T: yes

The example begins with the student initiating a movement towards the future doing by asking the teacher if he should start by assembling the rails. The teacher affirms and then a situation develops where the teacher together with the student discuss how the student should solve the task at hand, concerning the object of learning *assembling an underfloor heating system*. In the example, there are many clear explicit longitudinal orientations where the teacher and the student together talk about what should be done, how it should be done, and why it should be done in a specific way. In lines 2 and 4, the teacher suggests that an alternative for the student would be to begin his work of screwing together "the distributor", whereupon he in lines 8-11 urges the student to look in the "instruction papers" which tell how the whole thing should be "assembled". This is what the student should "start with" (line 13), the teacher points out, at the same time as he hands over the instruction papers to the student.

In lines 16 and 18 the teacher then says that the "most important lore" is to "read the manual". The student then seeks confirmation from the teacher (which he gets on line 20) when asking if it should "look like this" at the same time as he points to the drawing he has just received from the teacher. The student then notices that the installation he should do himself differs from the one in the drawing, and the teacher then confirms that the one the student should work on "only" has "two loops". In this sequence, the work process emerges as an object of learning that in parallel follows the concrete doing of this particular task – laying underfloor heating. The teacher emphasises the *reading of the manual* as the central object of

learning ("the most important lore") and that in it there is a process that must be followed in order to reach a certain goal. Already in lines 21-23, however, a variation between the number of loops that are on the manual and the number of loops that the student should use – i.e. a contrasting (as pattern of variation) of the number of loops as a critical aspect of *assembling an underfloor heating system* – emerges in the interaction between the teacher and student.

In lines 24-27, the teacher once again orients towards the drawing, and he also invites the student to do the same. This is followed by a longer sequence where the teacher and the student together, based on the manual, discuss how the continued work should be performed. Given the teacher's and student's dialogue, it appears that the placement of the adjustment distributor in the drawing differs from the placement it has on the material the student has to work with. Here, the teacher clarifies in line 40 that it is the manual that should be given priority, and that the distributor therefore should be put on the run. The object of learning that is in the foreground here is to *follow the manual* – but in relation to the content of the task in relation to laying underfloor heating, we can see a form of generalisation as pattern of variation, which concerns an interpretation where it is possible to conduct the task in another way (according to the student's suggestion, which is not clearly rejected by the teacher, but following the manual is given preferential interpretation). Here the student completes the teacher's turn by more precisely in line 43 conceptualising where the distributor is to be attached: On the "injustment (.) inflow". The slight rise in intonation at the end of the student's turn indicates some uncertainty, but the teacher's affirmative response leads to a situation where the student, together with the teacher in lines 44-54, also focuses on what to do next ("bend the pipes" to "the actual inflow" and "the return then".

After a longer break (4 seconds, not shown in the excerpt), the teacher points out that a large part of the actual "thinking job" (line 55), and what is "complicated" (line 56) in the work that the student is to perform is to "get it together" (line 58):

Example 1B: *the actual thinking job*

55. T: a large part is the actual thinking job (1.5) mm: what's
56. complicated is is this part



57. John: yes
58. T: to get it together (.) to lay the loops ((moves his right
59. hand)) that's: [less]less complicated
60. John: [>not that difficult<]
61. yes
62. T: there you just have to count maybe so that (.) "okey I
63. will go out there (.) and (.) then I go one lap two laps
64. three laps [four laps five laps and then I should get>>
65. John: [mm



66. T: >>back"((moves his arm in circles))
67. John: yes
68. T: so you don't end up (.) in a place where you can't get
69. back
70. John: exactly ((looks at the instruction papers))

Exactly what "it" is that is complicated is not made explicit verbally, but given the teacher's physical orientation towards the module which the student is to connect, and the manual they both turn their attention to, it is probably about the work to be done based on the manual, and which they just talked about. Here, too, the work process and *following the manual* as the object of learning is given the foreground position in relation to the actual doing. What the teacher calls the "thinking job" appears as an expected critical aspect (Kilbrink & Asplund, 2020), something that the teacher highlights as a potential difficulty in the upcoming work of laying the floor heating. Then the teacher orients towards – both verbally and physically – the work of laying the loops along the floor (lines 58). However, this work, unlike the other work, is a work that is "less complicated" (line 59) and the teacher receives support from the student who says that it is "not that difficult" (line 60). The teacher then makes another explicit longitudinal orientation when he introduces the student with the help of his embodied postures (Goodwin, 2000) to the upcoming work the student should do by publicly moving one arm back and forth in wide circular motions in the direction of the floor the student has to work on (lines 62-64 and 66). At the same time as he does that, he says that the only thing the student has to think about is to "count" the number of turns he should make loops, so that he does not "end up in a place" (line 68) where he "can't get back" (lines 68-69). When the teacher does this, he uses direct reported speech (Holt, 1996), and thus puts himself in the situation the student will end up in in the future. By counting the number of turns of the

loops, at the same time as he reinforces the action by physically "simulating" the turns in front of him (and the student), he visualises the future doing for the student. Here, the ability to think ahead, to prepare and plan the work emerges as a critical aspect of the work process linked to the specific task of *assembling an underfloor heating system*.

The analysis of the interaction that takes place in example 1A and 1B clearly shows that it is the manual/instruction papers that should guide the student's future work. As soon as the student has shown the teacher that he wants to figure out how to handle the task he has in front of him, the teacher's and the student's attention is directed (on the teacher's initiative) towards the instruction papers. Here, and throughout the example, the teacher positions himself as the more knowledgeable (teacher) who knows what is important to consider when the work is to be performed, while the student, already through his initial question to the teacher, positions himself as the less knowledgeable who seeks support and guidance from the teacher (Melander, 2012). The work to be done with *assembling an underfloor heating system* is also not just something that the student is informed about merely by the teacher. Together and socially they work to establish a common understanding (Asplund & Kilbrink, 2020) of what should be done, how it should be done and why it should be done in a specific way. When looking at this example as a coordinated interactional achievement, it is also apparent that the teacher and the student collaborate on both a verbal and bodily level. For example, in line 2 the teacher starts to explain what the student could start with, when the student smoothly fills in with a one-word utterance that fits the open syntactic structure. However, while indicating a word search (Goodwin & Goodwin, 1986; Sacks, 1992), the teacher comes in to help the student complete his turn and integrates the student's contribution into his own utterance. In the student's next turn, both the repetition of the teacher's "distributor" and the definitive "yes", function to ratify that the teacher's completion was an acceptable offering for what the student was going to say.

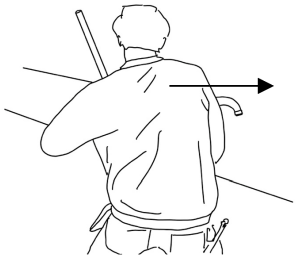
There is also – throughout the example – a very clear longitudinal orientation towards the future action – and we can see that special attention is directed to some critical aspects that the student has to consider. The first is that the student "only" has two loops to work with and connect, unlike what the manual says. The second critical step concerns the location of the adjustment distributor, which differs from the manual. As soon as these two critical aspects have been made visible, by contrasting them as pattern of variation, the teacher emphasises that this is precisely the complicated work, as opposed to *assembling an underfloor heating system*. But, even in this work, there are some critical aspects; namely to lay out the "right" number of loops and to not end up in a situation where you "can't get back" to the pump.

4.2 Movements Toward the Future Vocational Working Life

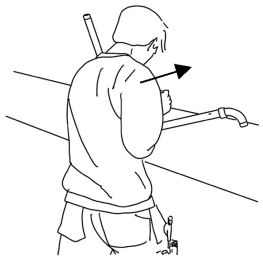
In the next example, the student Liam has some difficulty unscrewing some pipe fittings. As soon as the teacher (Roger) has finished a short conversation with another student nearby, the student notes this and calls for the teacher's attention:

Example 2: ***to have a long working life***

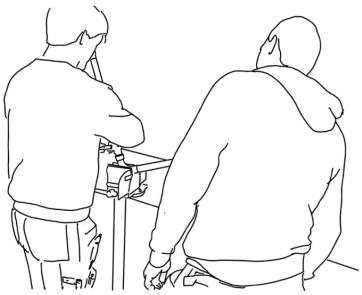
1. Liam: Roger how can I separate this pipe?
2. T: ((walks to the student)) take larger pliers
3. Liam: ((turns with the pair of pliers, struggles)) damn



4. T: there are larger £pliers£ ((laughs))
5. Liam: (x)
6. T: what are you saying?
7. Liam: (x) ((struggles))



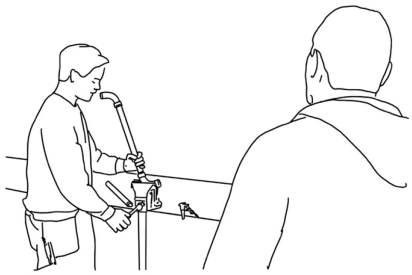
8. T: ye:s but e:: you are not getting much power are you



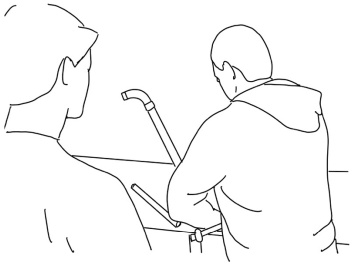
9. Liam: (x) I get all the [power from that one ((points to another
10. T: [all-
11. Liam: student, smiles))
12. T: we:ll I guess (.) but the thing is that (1.4) to be able
13. to have a long working life you should not have to use

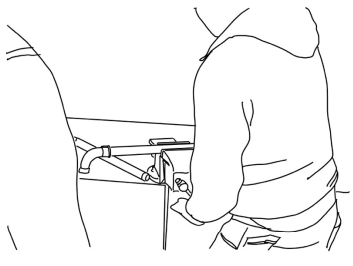


14. (1.6) all of your strength every day (.) the bigger tools
15. you've got (.) the less you have to use your body
16. Liam: well yes
17. T: and that is also important to keep in mind
18. Liam: oke:y

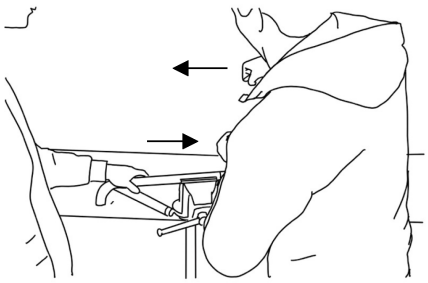


19. T: and then I wouldn't have set (.) the pipe like that
20. Liam: why then it doesn't move then
21. T: ((releases the pipe and screws it on again - in a new
22. position))

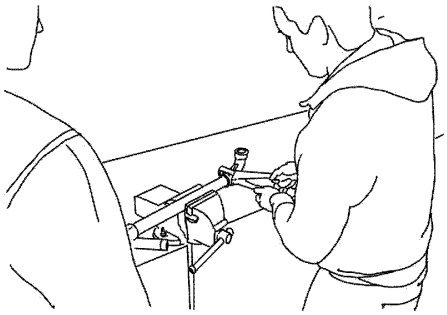




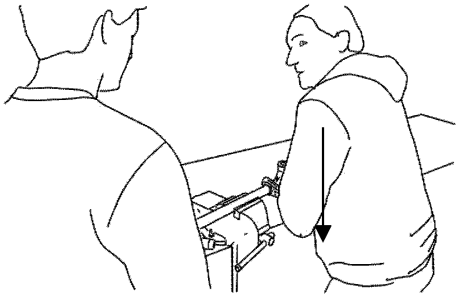
23. T: and then I had screwed it on that
24. Liam: mmwell that's true that's true
25. T: then you can imagine that instead of that you stand and
26. turn ((bends his body to the side)) (.) the pair of pliers



27. like this
28. Liam: yes
29. T: so now you should turn the part down ((screws the pair of
30. pliers on the pipe)) if you take a larger pair of pliers
31. and then you get the weight with you down so you can just



32. hang on like this



33. Liam: yes ((nods))
34. T: then [it is easy
35. Liam: [that's true (.) that's e:
36. T: ((leaves, turns around and points to the student)) but
37. take a larger (.) pair of pliers (.) that one yes

In line 1, the student initiates a longitudinal orientation towards the future doing by asking the teacher what he should do to separate the pipe parts from each other. The teacher then, after watching the student struggle with a pair of pliers, says that there are larger pliers (line 4, using a smiling voice and brief laugh particle (Jefferson, 1984)), and that the student's working position does not give him "much power" (line 8). The student then objects in a playful way, but then turns his gaze to the teacher who in line 12-15 develops a reasoning about the importance of finding work positions where you do not have to "use all of your strength (1.6) every day" (line 14). The teacher does this in relation to a longitudinal orientation towards the future professional life, and the argument put forward is that these are important aspects to keep in mind if you want to have a "long working life" (line 13). The teacher then, in lines 14-15, clarifies the whole thing by once again drawing attention to the tool and its size: "The bigger tools you've got, the less you have to use your body", and that this "is also important to keep in mind". Hence, in line 1 the student asks a concrete question that defines the object of learning that is in focus here and now (linked to the task at hand – *to separate some pipe fittings*), while the teacher then lifts up the question to an overall context and to a more overall object of learning, which is about *using the right tools in a way that does not put strain on the body in order to have a long working life*. In this overall context, the size of the tool then emerges as a critical aspect in the work of *unscrewing the pipes*, where the teacher uses contrasting as pattern of variation when comparing what the student does to what he instead should do. In this sequence, the size of the tool is linked to the power that the person using the tool can create. By applying more power from the tool, the user can put less strain on their body, which increases the opportunities for a longer working life in the industry.

In line 18, the student starts screwing the pipe into a new position in the vice, but given the teacher's response in line 19 to the student's action, there are other, and better ways of doing this. The student objects, asking why and claiming that it "doesn't move then". The teacher, however, continues and starts instructing the student how he could do this in a better and more ergonomic beneficial way. He does this by drawing attention to the future doing by first correcting the student's *placement of the pipe in the vice* (line 21-22) and then he says to the student that he had "screwed it on that" (line 23). The student then displays a changed understanding (line 24), agreeing with the teacher, whereupon the teacher both physically and verbally, first (in lines 25-26) shows how one can use the pair of pliers (which is presented as a less good way), and then he contrasts this way of doing with another way of using the pair of pliers, which the teacher highlights as more efficient. Hence, to use terminology from Variation Theory; contrast is used as a pattern of variation in relation to the critical aspect, that concerns the way of using the pair of pliers, of the object of learning how to use *the right tools in a way that does not put too much strain on the body, in order to have a long working life*. When doing this the teacher also uses his body to show how he can use the weight of his body in order to get more power into the pair of pliers, at the same time as he moves his head and gazes

towards the student (see line 31-32). Following the teacher's instruction, the student and the teacher establish a common stance around the object of learning on *how to use the right tools in a way that does not put too much strain on the body in order to have a long working life*, whereupon the teacher leaves the student, but then turns around and reminds the student to use a larger pair of pliers (which he does). Thus, in relation to working ergonomically sustainable, the working position also emerges as a critical aspect (hence, something the student needs to evolve in his work), and is highlighted by the teacher using different semiotic resources simultaneously.

From the very beginning in the example, the student initiates a movement forward towards the future doing by asking a concrete question to the teacher. What then takes place is a situation where the teacher and the student together reason about how the work can proceed in the best way. The analysis shows how the student's actions initiate new movements forward in that the teacher steps in and clarifies and corrects the student's actions. Furthermore the teacher explains how to use the pair of pliers in a right way. There is also a clear longitudinal orientation towards what is to be done even outside the classroom context. The teacher thus broadens both the time and the space perspective when he draws the student's attention to the fact that the body is a work tool that should maintain a long working life, and that this is something one must consider, as well as an approach one must apply to the work already in the classroom.

5 Discussion

In this article, the focus has been on the teaching processes that are set into play when a vocational teacher and vocational students orient towards future-oriented longitudinally established learning content in vocational education when interacting in vocational plumbing workshop lessons. A prominent pattern in the analysed examples presented in this article is how the teaching is characterised by two parallel processes, which the teacher and the students have to deal with together and simultaneously. These parallel processes include different learning contents, where one process is about how a task that the students are engaged in should be solved in the here and now, and where the other process concerns aspects that are more explicitly linked to a future profession, but still in relation to the practical doing.

As mentioned above, previous research has highlighted different kinds of learning and knowledge within vocational education, where the vocational specific learning content is one part, and learning for life in general is another (Baartman & de Bruijn, 2011; Eiríksdóttir & Rosvall, 2019; Illeris, 2009; Kilbrink et al., 2018; Lindberg, 2003; Nylund & Virolainen, 2019). However, in our study we can also see how different kinds of vocational learning and knowledge areas are simultaneously made relevant and oriented to in teaching situations in voca-

tional plumbing education by focusing on explicit orientations to longitudinal established content in our analysis.

In all the examples in this article, we can see how the students direct their attention to the practical doing here and now, while the teacher in his teaching simultaneously and in parallel together with the students works to establish a common understanding of how the concrete work should be executed here and now, also highlights another dimension in the teaching in the form of an orientation towards a general object of learning. In the article's first example, we can see how the teacher highlights the work process itself and the art of *following a manual* in the work of *assembling an underfloor heating system*, where following a manual becomes the more general object of learning. In the second example in the article, the teacher raises issues related to ergonomics and thus draws the student's attention to the importance of working with the body in a gentle and sustainable way to enable a long working life as a general and overall object of learning, when the specific task is about *unscrewing some pipe fittings*.

In relation to our first research question that concerns *how a common understanding of what is to be done and learned in vocational plumbing education is established in the interaction between a teacher and students*, the analysis shows that the orientation towards the concrete practical doing here and now in the teaching situations are student-initiated actions, while it is the teacher who initiates movements towards a future oriented longitudinally established learning content. The analysis also shows that the teaching situations in the examples are situations that are created by the students and the teacher together and socially by e.g. positioning themselves as less knowledgeable (student position) and more knowledgeable (teacher position) (Melander, 2012) and by orienting towards an longitudinal explicit learning content (Sahlström, 2011; Sahlström et al., 2010). These two aspects – i.e. that the students and the teacher position themselves as teacher and students and orient themselves towards a specific learning content – are also the two necessary conditions for learning that Marton (2010) argues that teachers through their actions must contribute to creating in a teaching situation. According to Marton, one of the conditions is about the actual "learning pact" (Marton, 2010, p. 238, our translation) between the teacher and the students. To enable teaching and learning, the teacher must open up to supporting the students in the learning process, while the students in turn must show that they want to learn and want to receive the teacher's support. The second condition for learning is that the students experience the differences in content that are necessary for them to be able to discern the critical features of the object of learning (Marton, 2010). These two conditions for learning are also interdependent – they intersect and work together – and they require work and effort on the part of the teacher. Thus, the teacher must create conditions where he can interact with his students when supporting their learning trajectories (eg. de Saint-Georges & Filliettaz, 2008; Filliettaz et al., 2015; Jakonen, 2018; Tapani & Salonen, 2019), in relation to the specific learning content. Our analysis thus shows what happens when these two conditions for learning

are created in the teaching situations we have analysed, and that they are the result of the teacher's and students' interactional accomplishments. As such, and in relation to our first research question, our findings are in line with those of Sakai et al. (2014) who emphasise the importance of technical knowledge of plumbing, as well as participants' interactional competences when establishing a shared recognition of spatiotemporally distant events and activities during the organisation and operation of a plumbing design in work settings.

On behalf of our second research question that concerns *what content is made relevant in these processes*, we can also see that when the teacher adds new objects of learning in the teaching situations, which in a sense is not something that is explicitly requested by the students, changed conditions are also created for the students' learning. In one respect, it is also conceivable here that the teachers' actions complicate the learning process for the students, as they are given more objects of learning that compete for the attention to relate to in the interaction with the teacher. One could argue that the teacher highlights more simultaneous aspects, which may make it difficult for students to experience the differences in content that are necessary for them to be able to discern the critical features of the content. However, with the support of Lo and Chik (2016) it is possible to argue that the teacher's strategies on the contrary can be strategies that can benefit students' learning in several respects, as the objects of learning and their critical aspects are handled and varied in relation to each other (internal horizons of fusion) but also in relation to a wider context (external horizons of fusion). What the teacher actually does is that he uses the students' commitment and publicly displayed focus as a didactic resource by putting what is to be done and learned here and now in a wider context. The specific learning content (object of learning) to which the students focus their attention (*to unscrew pipes and to assemble an underfloor heating system*) is incorporated simultaneously in a more overall and general context. As Lo and Chik (2016) argue, fusion in the external horizon may contribute to an understanding of how an object of learning is related to the wider context of the learning content in which it becomes a part. This movement may also lead to situations in which learning becomes connected with "real-world situation instead of isolated facts and knowledge" (Lo & Chik, 2016, p. 307). Thus, making it possible for students to experience an object of learning as a part of a wider context of the learning content may be a fruitful strategy to enable students to experience the same object of learning in a more nuanced way, and to develop an understanding of the dynamic nature of the specific object of learning. In our study, this is also related to a practical doing and we can see how complex the interrelationship between different objects of learning is when oriented to in interaction. Altogether, and linking back to our second research question, this illuminates how the different layers of work-specific vocational learning are made visible in the interaction, and how they mutually contextualise each other in the here and now.

6 Conclusion

In order to create favourable conditions for learning, it is important that teachers, together with students, establish a common understanding of what is to be learned, how it is to be learned and why it is to be learned in a specific way (Asplund & Kilbrink, 2020; Hudson, 2007; Kilbrink & Asplund, 2020). The content to be learned must also be defined, specified and communicated in order for students to be able to learn the content as well as possible (Marton, 2010). However, given the challenges students may encounter in practical doings in vocational work-shop sessions, vocational teachers may also consider the more general aspects that may discern as critical objects in the learning and teaching situation. Our analysis shows that this is not necessarily two different, separate, and countering processes that will complicate the students' learning trajectories. Rather, and with the support of Lo and Chik (2016), they can be used simultaneously and together, in order to open up for a more in-depth and nuanced learning of the specific object of learning that the students are supposed to learn in the teaching situation here and now. As such, our study emphasises the importance for vocational teachers to develop teaching strategies to navigate between contextualising the vocational learning content and making learning relevant for future vocational occupation and working life, and helping students in their problem solving and practical doings here and now.

In this study, teaching and learning has been approached as processes that include both the what-aspect and the how-aspect of teaching and learning. The use of CAVTA has enabled close and detailed analysis of these complex processes and made it possible to discern how, and in what ways, issues regarding form and content in the Sanitary, Heating and Property Maintenance Programme are closely interrelated and how they mutually contextualise each other in the analysed teaching and learning situations.

Nevertheless, we do not make any claims on how much or what the students actually learned, nor do we study what the teacher "really" intended with his teaching, limited as our study is to considering local interaction from an emic perspective (Duranti, 1997). However, it would be possible to study the whole teaching process by extending the approach taken in this study to teachers' and student's experiences of vocational knowing, and of the learning and teaching processes that takes place, in order to broaden the analysis of the local interaction in present. Another limitation with the study is that we are focusing on the teaching and learning processes that takes shape during lessons in one vocational program. Here, it would be fruitful to consider conducting more close studies of interaction in relation to teaching and learning a specific content on other VET programmes as well. This could contribute do a deeper knowledge and understanding of the complex processes that are set in play when vocational teachers and students interact in relation to a learning content.

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References

Andersson, P. (2019). *Att utbilda nästa generation i yrket: En kunskapsöversikt om och för yrkeslärare* [Educating the next generation in the profession: An overview of knowledge about and for vocational teachers]. Skolverket [the Swedish National Agency for Education].

Asplund, S-B., & Kilbrink, N. (2018). Learning how (and how not) to weld: Vocational learning in technical vocational education. *Scandinavian Journal of Educational Research, 62*(1), 1–16. https://doi.org/10.1080/00313831.2016.1188147

Asplund, S-B., & Kilbrink, N. (2020). Lessons from the welding booth: Theories in practice in vocational education. *Empirical Research in Vocational Education and Training, 12*(1). https://doi.org/10.1186/s40461-020-0087-x

Baartman, L. K., & de Bruijn, E. (2011). Integrating knowledge, skills and attitudes: Conceptualising learning processes towards vocational competence. *Educational Research Review, 6*(2), 125–134. https://doi.org/10.1016/j.edurev.2011.03.001

Baartman, L., Kilbrink, N., & de Bruijn, E. (2018). VET students' integration of knowledge engaged with in school-based and workplace-based learning environments in the Netherlands. *Journal of Education and Work, 31*(2), 204–217. https://doi.org/10.1080/13639080.2018.1433821

Chan, S. (2017). The reciprocity of "imitative learning" through apprenticeship. *Vocations and Learning, 10*(3), 325–342. https://doi.org/10.1007/s12186-017-9175-x

de Saint-Georges, I., & Filliettaz, L. (2008). Situated trajectories of learning in vocational training interactions. *European Journal of Psychology of Education, 23*(213). https://doi.org/10.1007/BF03172746

Duranti, A. (1997). *Linguistic anthropology*. Cambridge University Press.

Drew, P., & Heritage, J. (2006). Editors' introduction. In P. Drew & J. Heritage (Eds.), *Conversation analysis* (Vol. 1. pp. xxi–xxxvii). Sage.

Eiríksdóttir, E., & Rosvall, P. Å. (2019). VET teachers' interpretations of individualisation and teaching of skills and social order in two Nordic countries. *European Educational Research Journal, 18*(3), 355–375. https://doi.org/10.1177/1474904119830022

Filliettaz, L., Durand, I., & Trébert, D. (2015). Learning through verbal interactions in the workplace: The role and place of guidance in vocational education and training. In L. Filliettaz & S. Billett (Eds.), *Francophone perspectives of learning through work. Professional and practice-based learning* (Vol 12, pp. 279–301). Springer.

Goodwin, C. (2000). Action and embodiment within situated human interaction. *Journal of Pragmatics, 32*(10), 1489–1522. https://doi.org/10.1016/S0378-2166(99)00096-X

Goodwin, C. (2006). Human sociality as mutual orientation in a rich interactive environment: Multimodal utterances and pointing in aphasia. In N. J. Enfield & S. C. Levinson (Eds.), *Roots of human sociality: Culture, cognition and interaction* (pp.97–125). Berg.

Goodwin, M. H., & Goodwin, C. (1986). Gesture and coparticipation in the activity of searching for a word. *Semiotica, 62*(1-2), 51–75. https://doi.org/10.1515/semi.1986.62.1-2.51

Gåfvels, C. (2016). Vision and embodied knowing: The making of floral design. *Vocations and Learning, 9*(2), 133–149. https://doi.org/10.1007/s12186-015-9143-2

Hepburn, A., & Bolden, G. B. (2013). The conversation analytic approach to transcription. In J. Sidnell & T. Stivers (Eds.), *The handbook of conversation analysis*. Wiley Blackwell.

Holt, E. (1996). Reporting on talk: The use of direct reported speech in conversation. *Research on Language and Social Interaction, 29*(3), 219–245. https://doi.org/10.1207/s15327973rlsi2903_2

Hudson, B. (2007). Comparing different traditions of teaching and learning: What can we learn about teaching and learning? *European Educational Research Journal, 6*(2), 135–146. https://doi.org/10.2304/eerj.2007.6.2.135

Illeris, K. (2009). Transfer of learning in the learning society: How can the barriers between different learning spaces be surmounted, and how can the gap between learning inside and outside schools be bridged? *International Journal of Lifelong Education, 28*(2), 137–148. https://doi.org/10.1080/02601370902756986

Jakonen, T. (2018). Retrospective orientation to learning activities and achievements as a resource in classroom interaction. *The Modern Language Journal, 102*(4), 758–774. https://doi.org/10.1111/modl.12513

Jefferson, G. (1984). On the organization of laughter in talk about troubles. In J. M. Atkinson & J. Heritage (Eds.), *Structures of social action: Studies in conversation analysis* (pp.347–369). Cambridge University Press.

Kilbrink, N., & Asplund, S.-B. (2018). "This angle that we talked about": Learning how to weld in interaction. *International Journal of Technology and Design Education, 30*(1), 83–100. https://doi.org/10.1007/s10798-018-9490-z

Kilbrink, N., Asplund, S.-B., & Asghari, H. (2021). Introducing the object of learning in interaction: Vocational teaching and learning in a plumbing workshop session. *Journal of Vocational Education & Training*. https://doi.org/10.1080/13636820.2020.1850512

Kilbrink, N., Bjurulf, V., Olin-Scheller, C., & Tengberg, M. (2014). Experiences of educational content in Swedish technical vocational education: Examples from the energy and industry programmes. *International Journal of Training Research, 12*(2), 122–131. https://doi.org/10.1080/14480220.2014.11082035

Kilbrink, N., Bjurulf, V., Baartman, L., & de Bruijn, E. (2018). Transfer of learning in Swedish technical vocational education: Student experiences in the energy and industry programmes. *Journal of Vocational Education & Training, 70*(3), 455–475. https://doi.org/10.1080/13636820.2018.1437064

Khaled, A., Gulikers, J., Biemans, H., & Mulder, M. (2016). Occurrences and quality of teacher and student strategies for self-regulated learning in hands-on simulations. *Studies in Continuing Education, 38*(1), 101–121. https://doi.org/10.1080/0158037X.2015.1040751

Lave, J. (1993). The practice of learning. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context* (pp. 3–34). Cambridge University Press.

Lindberg, V. (2003). Learning practices in vocational education. *Scandinavian Journal of Educational Research, 47*(2), 157–179. https://doi.org/10.1080/00313830308611

Lo, M. L. (2012). *Variation theory and the improvement of teaching and learning*. Acta universitatis Gothoburgensis. https://gupea.ub.gu.se/bitstream/2077/29645/5/gupea_2077_29645_5.pdf

Lo, M. L., & Chik, P. P. M. (2016). Two horizons of fusion. *Scandinavian Journal of Educational Research, 60*(3), 296–308. https://doi.org/10.1080/00313831.2015.1119730

Lucas, B., Spencer, E., & Claxton, G. (2012). *How to teach vocational education: A theory of vocational pedagogy*. The City and Guilds of London Institute. https://www.worldskillsuk.org/media/1835/how-to-teach-vocational-education.pdf

Marton, F. (2010). Samtalsanalys och pedagogik [Conversation analysis and pedagogy]. In H. Melander & F. Sahlström (Eds.), *Lärande i interaction* [Learning in interaction] (pp. 216–242). Liber.

Marton, F. (2015). *Necessary conditions of learning*. Routledge.

Marton, F., & Tsui, A. B. M. (Eds.) (2004) *Classroom discourse and the space of learning*. Erlbaum.

Melander, H. (2012). Knowing how to play the game of jump rope: Participation and stancetaking in a material environment. *Journal of Pragmatics, 44*(11), 1434–1456. https://doi.org/10.1016/j.pragma.2012.06.018

Melander, H., & Sahlström, F. (2010). *Lärande i interaktion* [Learning in interaction]. Liber.

Nore, H. (2015). Re-contextualizing vocational didactics in Norwegian vocational education and training. *International journal for research in vocational education and training, 2*(3), 182–194. https://doi.org/10.13152/IJRVET.2.3.4

Nylund, M., & Virolainen, M. (2019). Balancing "flexibility" and "employability": The changing role of general studies in the Finnish and Swedish VET curricula of the 1990s and 2010s. *European Educational Research Journal, 18*(3), 314–334. https://doi.org/10.1177/1474904119830508

Pang, M. F., & Ki, W. W. (2016). Revisiting the idea of "critical aspects". *Scandinavian Journal of Educational Research, 60*(3), 323–336. https://doi.org/10.1080/00313831.2015.1119724

Sacks, H. (1992). *Lectures on conversation* (Volume 1). Blackwell.

Sacks, H., Schegloff, E.A., & Jefferson, G. (1974). A simplest systematics for the organization of turn-taking in conversation. *Language, 50*(4), 696–735.

Sahlström, F. (2011). Learning as social action. In J. K. Hall, J. Hellermann & S. P. Doehler (Eds.), *L2 interactional competence and development* (pp. 45–65). Multilingual Matters.

Sahlström, F., Hummelstedt, I., Forsman, L., Pörn, M., & Slotte-Lüttge, A. (2010). Samma innehåll olika sammanhang: Mikro-longitudinellt lärande i sjuåringars vardag [Same content, different contexts: Micro-longitudinal learning in seven-year-olds' everyday lives]. In C. Lindholm & J. Lindström (Eds.), *Språk och interaktion 2* [Language and interaction 2] (pp. 1–22). University of Helsinki.

Sakai, S., Korenaga, R., Mizukawa, Y., & Igarashi, M. (2014). Envisioning the plan in interaction: Configuring pipes during a plumbers' meeting. In M. Nevile, P. Haddington, T. Heinemann & M. Rauniomaa (Eds.), *Interacting with objects: Language, materiality, and social activity* (pp. 339–356). John Benjamins Publishing Company.

Schaap, H., Baartman, L. K. J., & de Bruijn, E. (2012). Students' learning processes during school-based learning and workplace learning in vocational education: A review. *Vocations and Learning, 5*(2), 99–117. https://doi.org/10.1007/s12186-011-9069-2

Schaap, H., van der Schaaf, M., & de Bruijn, E. (2017). Interactions in vocational education: Negotiation of meaning of students and teaching strategies. *Studies in Continuing Education, 39*(1), 52–70. https://doi.org/10.1080/0158037X.2016.1234451

Schegloff, E.A. (1997). Whose text? Whose context? *Discourse & Society, 8*(2), 165–187. https://doi.org/10.1177%2F0957926597008002002

Schegloff, E. A. (2007). *Sequence organization in interaction. A primer in conversation analysis* 1. Cambridge University Press.

Sidnell, J. (2013). Basic conversation analytic methods. In J. Sidnell & T. Stivers (Eds.), *Conversation analysis* (pp. 77–99). Wiley Blackwell.

Stevanovic, T. M., & Weiste, E. H. (2017). Conversation-analytic data session as a pedagogical institution. *Learning, Culture and Social Interaction, 15*, 1–17. https://doi.org/10.1016/j.lcsi.2017.06.001

Säljö, R. (2005). *Lärande och kulturella redskap. Om lärprocesser och det kollektiva minnet* [Learning and cultural tools: About learning processes and the collective memory]. Norstedts Akademiska Förlag.

Tapani, A., & Salonen, A. O. (2019). Identifying teachers' competencies in Finnish vocational education. *International Journal for Research in Vocational Education and Training, 6*(3), 243–260. https://doi.org/10.13152/IJRVET.6.3.3

Tuomi-Gröhn, T., & Engeström, Y. (2003). *Between school and work: New perspectives on transfer and boundary-crossing*. Pergamon.

Vetenskapsrådet. (2017). *God forskningssed* [Good research practice]. Vetenskapsrådet [Swedish Research Council].

Öhman, A. (2018). Twist and shape: Feedback practices within creative subject content of hairdressing education. *Vocations and Learning, 11*(3), 425–448. https://doi.org/10.1007/s12186-017-9196-5

Öhman, A., & Tanner, M. (2017). Creating space for students' concerns: Embodied feedback practices in hairdressing education. *Learning, Culture and Social Interaction, 14*, 79–93. https://doi.org/10.1016/j.lcsi.2017.04.005

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Comparative Analysis of the Process of Training Education Managers in Educational Institutions

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Abstract

Context: A significant part of future specialists receive only practical skills without formal practical exam situation. In this regard, there is a need to train a manager who can adapt and be ready to carry out his/her activities in a specific profile interaction. The aim of the experimental study was to develop and test the advanced working hypothesis about the possibility of effective formation of readiness for future self-realisation of future education managers.

Approach: The work uses mathematical methods for testing the hypothesis of testing the readiness of education managers with verification of competency type.

Findings: The novelty of the study is determined by what the authors are considering "the possibility of training a manager in accordance" including not only the standards for the provision of educational services to the population, but also the possibility of introducing world-class training standards. The authors show that the basis for such a development may be the readiness to work in a globalised environment. The dynamics of changes in the indicators of the levels of readiness for professional self-realization of students studying in the control and experimental groups from the first to the fourth year were compiled and recorded. The methodology of vocational training of students for the purpose of their self-

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realisation during training has been specified. The practical significance of the study is determined by the fact that integration with the global educational environment should be based on international standards for the provision of educational services.

Conclusions: The results of this research can be useful and interesting to international readers, as the parameters of educational and methodological support have been developed and tested, which contains a set of situational exercises to form readiness for professional self-realisation for future education managers. Also, the conducted analysis indicated serious problems with the employment of university graduates both in the Republic of Kazakhstan and in the Republic of Lithuania.

Keywords: Education, Higher School Management, Educational Policy, Educational Technology, Strategy, Vocational Education and Training, VET

1 Introduction

The formation of educational and scientific space is determined by world political and economic structures. The most important are the requirements for the training of qualified specialists in all fields of activity, in particular, in education (Kim & Lee, 2019; Chen et al., 2019; Urbani, 2020). An important task is to produce a specialist who will have such competencies as: The ability to make decisions in standard and non-standard situations and be responsible for them, search for and use the information that is necessary for the effective performance of professional tasks, use information and communication technologies, work in a team, navigate the processes of technology development in professional activities, engage in self-education and constantly improve their skills. The high dynamism of the modern business world, continuous and significant changes in technologies in the labour market and sales, the formation of a single information space, the growing need for specialists in the economic profile affect the nature of the requirements for the quality of modern education (Nalivayko & Granina, 2019).

Of particular relevance in market conditions is the problem of training professional personnel for the educational sphere, since significant transformations in all structures of society and the general democratisation of life results in a reduction in the time needed for graduates to adapt to work and increase their mobility and competitiveness (McDonald, 2000). In modern society, the level of professional training of a student is the main potential for professional growth, therefore, a future specialist must skilfully use the accumulated knowledge (Altinay et al., 2017). The quality of education is a necessary component of the life of a modern person, with intelligence and education, breadth and flexibility of professional training, the desire for creativity and the ability to solve non-standard tasks (Guntzburger et al., 2017; Shtyfurak & Shtyfurak, 2018). The task of modern universities is to educate a per-

son who can integrate into reality, which is constantly changing, overcome difficulties and achieve success (Basari & Altinay, 2018). Modern universities brought a new dynamism to higher education to the benefit of students, staff and society. Higher education is faced with the task of creating the conditions for students' self-realisation, developing their individuality and creative potential, and ensuring the development of a professional and personal culture of a specialist. The professional culture of a specialist is a combination of special knowledge and experience of their implementation in professional activities. Special requirements are now being set for the training of specialists in the field of management – managers, as the most active subjects of a market economy (Morozova et al., 2016), who are able to actively to the current conditions, leaders with strategic thinking and professional image.

2 Literature Review

A young specialist, an education manager who is equipped with basic knowledge after graduation, requires a lot of time in order not only to be ready for professional self-realisation, but also to adapt to the conditions of professional activity in a particular place (Kusainov, 2017). The existing system of vocational training for students receiving a speciality in higher education institutions pays the greatest attention to vocational training, where knowledge, abilities and students‘ high level of skills are necessary to receive skills in general, which is not correct since any higher education institution should offer basic skills to students and not expect them to already have the skills/knowledge, while a young specialist in the process of labour activity faces except for professional problems (the level of his knowledge, skills), problems of a psychological and social nature (Macheridis, 2018; Liubaretz, 2019).

The preparation of the future education manager for professional self-realisation should be based on the processes of transformation and adaptation to international requirements and national expectations, in the context of the transformation of the entire education system (Wei & Liu, 2015). From the need to bring schools that train managers to the standards of international managerial education, it follows that managerial training should be based on programs that take into account common problems of the economy and the organisations operating in it, to prepare future specialists for professional activities in the domestic and international labour markets, to form a readiness for professional self-realisation in the future activities of an education manager.

The phenomenon of readiness for professional self-realisation is considered in the mainstream of each of the professional fields of activity of a specialist. Readiness for professional activity is a kind of "response" to the totality of professionally determined requirements for a personality of an education manager (Davies, 1992). At the beginning of the last century, the problem of readiness became an important object of scientific research. Scientists

developed aspects of the theory of attitude. This phenomenon has been studied by scientists in connection human mental processes (Teichler, 1995).

Professional self-realisation is an active process, therefore, in the study of the preparation of the future education manager for professional self-realisation, we analysed the concept of "psychological readiness for activity", which was introduced in 1976, in studies on engineering psychology and labour psychology (Kuoppakangas et al., 2019). Scientists highlight the psychological component of professional readiness, which plays an important role in mastering a profession (O'Donoghue & Heanue, 2018). This understanding has become an important argument for using the concept of readiness as a result of preparing a specialist for professional self-realisation (Agasisti, 2017; Tovkanets, 2019).

The problem of the student's readiness for professional self-realisation remains one of the urgent in modern psychology and pedagogy, and is a component of professional readiness for professional activity (Alstete, 2006). An analysis of existing approaches shows that readiness is studied as a certain state of consciousness, psyche, functional systems in a situation of responsible actions (Degn, 2015). Readiness is expressed as an opportunity, the ability of a subject to act at a fairly high level, the decisive condition for quick adaptation to working conditions, further professional development and professional self-realisation (Teehankee, 2018; Pryshlyak, 2018).

Professional readiness is a subjective state of a person who is considered capable and prepared to carry out a certain professional activity and striving to perform it at a high level with the goal of self-realisation (Haines, 1973). Professional readiness is closely connected with such a concept as professionalism in the field of economic activity (Riad Shams & Belyaeva, 2019). In this situation, the lack of prestige of knowledge, education and the lack of professional training of future specialists in Republic of Lithuania and the Republic of Kazakhstan for professional self-realisation in all spheres of activity is of special urgency and significance (Al-Zawahreh et al., 2019). The development of the problem of the formation of a value relation to professionalism has social (forms professionalism as a moral value, value relations in all areas of human activity) and scientific (serves as a means of knowing the intellectual and professional capabilities of people) significance.

3 Materials and Methods

The organisational scheme of the experimental study provided for the sequential implementation of three stages: Ascertaining, formative, and final. During the formative stage of the experiment, the following problems were solved:

– Development and testing of educational and methodological support, which contains authentic materials and a set of exercises for the formation of future managers of education readiness for professional self-realisation;

– The methodology of vocational training of students with the aim of their self-realisation during training was specified;

– Certain pedagogical conditions and a model for the formation of professional self-realisation of future education managers were implemented.

The organisation of the formative stage of the experimental study provided for the implementation of certain pedagogical conditions that contributed to the preparation of the future education manager for professional activity. In the process of organising the experiment on the formation of the readiness of future education managers for professional self-realisation, we proceeded from that the studied process of forming the professional quality of a personality will significantly improve when the selected and justified pedagogical conditions are introduced into the educational process.

Therefore, the aim of the experimental study was to develop and test the advanced working hypothesis about the possibility of effective formation of readiness for future self-realisation of future education managers. It was also revealed that the pedagogical experiment in our study is a multicomponent hierarchically organised system process, the basis of which is the study of the disciplines "Management in education", "Fundamentals of psychological and pedagogical management", "Quality management of education at school", "Administration of work in school", "Management of the content of education", "Economics and finance in educational institutions".

In the pedagogical experiment, 3 stages were clearly defined:

– Preparatory (selection of training materials, definition of tasks, preparation of tests to determine the levels of formation of readiness for professional self-realisation);

– Main (experiment);

– Final (processing of the obtained results, their interpretation, preparation of methodological recommendations and their introduction into teaching practice at the faculty of international business and management of an economic university).

The formative stage of the experiment was carried out in stages on the basis of the Al-Farabi Kazakh National University during the 2017-2019 school year. For the experiment, control and experimental groups of students with approximately the same composition and initial level of knowledge of the majors were selected. In total, 216 students of 1-4 years of Al-Farabi Kazakh National University, who studied in the second year (216 students) and in the fourth year (186 students).

Students were divided into control (CG) and experimental (EG) groups as follows: In the second semester of the 2016-2017 school year, four experimental groups (104 students) and four control groups (112 students) who studied in the first year were identified. In the 2017-2018 academic year, these same students studied already in the second year, but their number decreased and amounted to 100 students in the experimental group and 105 students in the control groups. In the 2018-2019 academic year, students of the EG, who were already 95 people, and control groups (98 students) studied in the third year. The final stage of the experimental study took place in the first semester of the 2019-2020 academic year with students already in the fourth year. There were 92 students in the experimental groups and 94 students in the control groups.

In educational institutions of the Republic of Lithuania, the education manager is defined as specialisation in the same way as in Kazakh University where this direction acts only as a discipline of a separate direction and part of a varied retraining cycle. In this regard, the training program is considered as part of the specialisation in universities of the Republic of Lithuania. Due to the fact that these training levels are not comparable and cannot be studied in comparable parameters, the efficiency of employment is considered as an indicator of the resulting type.

4 Results and Discussion

We determined the control group (CG) and experimental group (EG) according to the input levels of students' readiness for professional self-realisation, which had approximately the same values in the CG and the EG. This makes it possible to obtain reliable research results in traditional and experimental conditions for the formation of future professional education managers. In the experimental groups, students studied using innovative technology. In these groups, the preparation of the future education manager for professional self-realisation was carried out. An experimental methodology was applied using authentic materials of a professionally significant nature, role-playing games and a set of exercises aimed at developing the skills necessary for professional communication, which is especially important for future education managers. In the control groups, training was carried out according to traditional methods, that is, according to work programs.

In the process of research in the experimental and control groups, the classes were held by the same teachers in each academic discipline, which ensured the uniformity of requirements for the participants in the experiment, and also made it possible to purposefully control the educational process. Other teachers (with pedagogical experience from 5 to 20 years) in the role of competent mentors were also involved in the experiment, which contributed to the objectivity of assessing knowledge, formed skills and abilities of students. During the formative stage of the pedagogical experiment, educational and methodological material and

various types of educational activities provided for the Pedagogy and Psychology program for students of 2-4 years and "pedagogical specialties" for second-year students were used. Since an experimental study was conducted among students from the second to the fourth year, therefore, the main attention was paid to the methodological support of the speciality "Pedagogy and Psychology" for the preparation of students.

To conduct the formative stage of the experiment, authentic materials of a professionally significant nature were selected, on the basis of which complexes of classes from practical courses were developed. The use of such training complexes contributed to the formation of readiness for professional self-realisation among future education managers. Pre-experimental and post-experimental tests were used. With the help of tests, we evaluated the strength of students' assimilation of knowledge, understanding of the possibilities of their application in professional activities. We adhered to the opinion of those scientists who believe that the content and types of tests should be the same both in the beginning and at the final stage of the experiment. Only in this case it was possible to objectively compare the results. Test assignments were offered in hard copy and performed by each student separately on distribution cards. Before testing in each experimental group, students were given oral instructions. With the help of testing, the level of knowledge of future education managers was verified and the following were established:

– Knowledge of management in education;

– Knowledge of professionally guided pedagogy of terminology;

– The ability to compose dialogues of professional communication;

– Ability to write a message, resume, business letter;

– Skills and ability to negotiate professional areas.

Given the fact that the level of assimilation of educational material is an indicator of the cognitive activity of future specialists, in order to improve the quality of assimilation, it is necessary, first of all, to direct work of students to use the knowledge that they already know in practice. So, students can realise the need to acquire new knowledge. For this, three cross-sections of knowledge were carried out. The first was carried out after the first course of study – before stage 2. Its purpose was to establish the degree of formedness of the readiness of future education managers for professional self-realisation after the first part of the experiment. The second cross-section was carried out after the end of the third course of study. Its task was to determine the level of formedness of skills and professional communication after the completion of experimental training and the effectiveness of our educational and methodological support, which contains authentic materials and a set of situational exercises

to form readiness for professional activity for future education managers. The third cross-section was made at the end of the first semester of the fourth year. Its task was to determine the level of formedness of skills of a professional education manager after the end of the experimental study in order to establish the effectiveness of our proposed methodology for training future specialists. During the sections of knowledge, students performed the following types of tasks: Solving situational problems, case studies, communicative trainings, and management seminars.

Educational and cognitive tasks that were created for the studied disciplines were focused on the basic requirements that related to managerial skills. Basic requirements are requirements such as conceptual skills, that is, a person's skills to perceive an organization as a whole and at the same time clearly understand the specifics and interrelationships of its parts, social skills, that is, skills of working with people and achieving organizational goals with the help of people and technical skills, which are special skills and which are necessary to perform work tasks: Possession of methods, technologies, methods of solving problems, the ability to use equipment. Therefore, educational texts, exercises, and cognitive tasks included the lexical and grammatical material necessary to fulfil the professional functions of an education manager. The training complex was developed specifically to test the level of readiness of future managers for professional self-realisation: Development of writing skills; form of control – the ability to draw up plans, questions, annotations, resumes in thematic texts, writing private letters, essays, reports.

Students of the experimental groups performed situational exercises. The tasks used during the experiment provided for the manifestation of student skills in writing texts that contain given communication conditions and a description of the speech situation. An expert survey involved identifying the opinions of managers of practitioners and scientists exploring this area on the problematic aspects of training education managers. The survey suggested 12 key questions in blocks: Features of the training of education managers in the country; design of training content, priorities; difficulties and prospects.

Practitioners and scientists from Kazakhstan and Lithuania were involved as experts. The following is an analysis of expert responses. In the Republic of Kazakhstan, targeted training of education managers has been carried out for the past 10 years. Although, the first experimental programs began to be implemented in 1998 on the basis of Al-Farabi Kazakh National University at master's level. Modern requirements for the level of training of education managers are not regulated by the standard, and there are no professional standards of education managers in Kazakhstan. The difference between managers and directors, according to experts, is in functional responsibilities: Managers – directors and deputy directors of educational organisations; directors – leaders of educational systems at the region or district level. The functional responsibilities of an education manager are determined by the relevant provisions of the Ministry of Education and Science of the Republic of Kazakhstan. At the

same time, they note that directors of schools, colleges and kindergartens are taught management after being appointed to the post and there is not enough time for training. Training reserve managers does not justify itself. Of these, no more than 4% are prescribed.

Assessing the modern system of training education managers, experts note that the basic principles of educational design have remained unchanged, as they change as the goals of the activities of educational organisations change. In the framework of university programs, the quality of managerial training is low, because of the weak practical part. The parameters for evaluating the development of programs are qualimetric in nature, although there should be other evaluation systems. The state acts as the main employer in the training of education managers, but it does not deal with the intended purpose and managers are trained at universities only because it is fashionable. There is no state order for this profession. The state order remained after the Soviet planned economy. Government orders are orders for the supply of goods, the provision of services, which are placed by state and municipal organizations. These orders are financed from the state budget, regional and municipal budgets, as well as extra-budgetary funding sources.

The training of education managers (for the functional purpose of this profession) in the Republic of Lithuania began in early 2000 at the master's level, and in general, advanced training courses in management began to be offered in the country from the beginning of the 90s. As key requirements, experts highlight the ability of a manager to independently plan his/her activities in an educational institution, pursue a financial policy, manage the learning process at school, and manage material and human resources. In general, the requirements for the education managers are enshrined in the legislative and regulatory documents of Lithuania. The experts do not note a significant difference between managers and directors, it is often used as synonyms. Purely theoretically, these concepts differ in that the activity of a director is an activity aimed at streamlining of planned processes in a team, then the main task of a manager is to create a self-organising team that will develop in any conditions.

At present, issues of professional suitability and the creation of a reserve of education managers are relevant for Lithuania. For several years now, a system for testing applicants has been introduced in the country: Those who want to occupy the positions of managers in educational institutions must pass professional suitability tests. Tests are carried out in a centralised way (the organisation under the Ministry of Education and Science is responsible for them); passed tests receive confirmation of compliance with the requirements for the manager in the field of education (the requirements are expressed by a set of competencies, the tests are designed in such a way as to identify these necessary competencies). Tested persons form a reserve of potential managers and have the opportunity to nominate for managerial positions. You can also highlight the problem of rotation of managers, which is associated with the above. The main difficulties in the practical activities of education managers are associated with the perception and evaluation of the activities of leaders on the part of society.

Frequent changes in the legislative framework and reforms have not quite a positive impact on managers. There is also no standard in Lithuania.

Mainly, the following are distinguished as functional duties:

– Organisation of the development of training programs in accordance with the needs of students, society and based on legislative documents of the country;

– Organisation of the development of a strategic plan for the development of the organisation and its implementation on the basis of empirical research, evaluation of new ideas and possible social consequences;

– Creation of the necessary conditions and clear plans for further career growth of all members of the organization and improving their qualifications.

In the structure of training, the following groups of competencies are distinguished as guidelines: Management of the organisation's policy and strategy; content management; people management; resource management. As the leading technologies providing the formation of these competencies in the university environment, project technologies, "case study", mixed technologies and e-learning, etc. The main principles of designing the content of training for the Ministry of Education are consideration of the current context, educational policies, practical needs, as well as borrowing the experience of other countries. The quality of training should be ensured by the integration of university education and professional training. At the moment there is poor integration. Ideally, employers should be involved in program design. There are examples when employers – local government administrations – take the initiative to organise different courses, study for the closest reserve of school leaders. However, this is not enough.

Experts do not see a significant difference in concepts between manager and executive, these words are synonyms, but in general semantics "direction" is a broader concept than "management". Since education is practically not a subject of the market, in any case, the principles of management can only be partially implemented. Difficulties in the work of education managers are: An uncertain regulatory framework; lack of funds for material incentives; excess reporting; a large number of activities launched from the top, which are often complementary to the actual practice of the school, and therefore unnecessary; entrusting with the education managers a large number of economic functions in the absence of specialists capable of performing them.

The functional responsibilities of an education manager, based on professional standards, include four generalised duties, which fall into 52 labour. The planning function – orders, recommendations, planning of the educational process, strategic planning, personnel planning, procurement planning, etc. The function of an organisation is to bring the decision

(plan) to an executor, material and technical support for the possibility of implementing this decision, coordinating this decision with the settings and needs of subordinates, delegating authority. The function of motivation is the creation of a system of motivation and stimulation. The control function is the process of obtaining and processing information about the progress and results of the educational process and making appropriate management decisions on its basis (monitoring, studying, analysing, diagnosing and evaluating the performance of performers).

Among the relatively new principles for the content of training education managers: The introduction of social partnership as a requirement (the need to involve employers in the planning and implementation of educational programs); revision of pedagogical technologies used in the learning process (continued bias towards interactive forms); focus on Softskills development; project approach; reduction in the percentage of lectures; increased role of self-education; digitalisation. Unfortunately, evaluating the quality of training, experts disagreed. It turns out that the strategic and innovation block is practically not in demand, since managers are "sucked up" by solving operational problems, which is complicated by the fact that the management apparatus in educational organisations, especially of secondary education, is small and loaded with reports. Employers do not evaluate the quality of training, but the ability of managers to solve current problems. However, in the fact that the weak integration of educational, scientific, and industrial activities leads to the separation of theory from practice, experts have shown unanimity. The participation of employers in the design of content is the same as in Kazakhstan: Employers review educational programs, take students to practice, and participate in final certification. However, real participation in the design of the content is weak and often it is formal.

To analyse the results of an experimental study, we recorded the dynamics of indicators of levels of readiness for professional self-realisation of students studying in the control (CG) and experimental groups (EG) from the first to fourth years (Table 1).

Table 1: Results of the Formative Stage of Experimental Study

Year	Group	Stage of control	Indicators of students' radiness for professional self-realisation								
			High (5 points)		Sufficient (4 points)		Satisfactory (3 points)		Low (2 points)		Average
			People	%	People	%	People	%	People	%	
1	CG	Entry control	2	1.79	40	35.71	66	58.93	4	3.57	3.36
		Final control	3	2.68	42	37.5	65	58.03	2	1.79	3.41
	EG	Entry control	2	1.92	36	34.62	63	60.58	3	2.88	3.36
		Final control	9	8.65	43	41.35	52	50.0	0	0	3.59
2	CG	Entry control	2	1.9	38	36.2	63	60.0	2	1.9	3.38
		Final control	3	2.85	40	38.1	61	58.1	1	0.95	3.4
	EG	Entry control	7	7.0	40	40.0	53	53.0	0	0	3.54
		Final control	11	11.0	44	44.0	45	45.0	0	0	3.66
3	CG	Entry control	1	1.02	38	38.78	58	59.18	1	1.02	3.4
		Final control	2	2.04	39	39.8	57	58.16	0	0	3.48
	EG	Entry control	7	7.37	39	41.05	49	51.58	0	0	3.56
		Final control	13	13.68	43	45.26	39	41.05	0	0	3.73
4	CG	Entry control	2	2.13	33	35.11	59	62.76	0	0	3.43
		Final control	5	5.32	35	37.23	54	57.45	0	0	3.48
	EG	Entry control	11	11.96	41	44.56	40	43.48	0	0	3.69
		Final control	19	20.65	49	53.26	24	26.09	0	0	3.95

An analysis of the tabular data allows to conclude that regardless of the fact that the number of students in the control and experimental groups changed annually, the effectiveness of the formation of future managers of education for professional self-realisation in the experimental groups was determined by the best indicators at all levels than in the CG. Comparing the dynamics of the average indicators that was observed in the CG and the EG throughout the entire formative stage of the experimental study. At the beginning of the formative stage of the experiment, it was found that the average readiness for future self-realisation of future education managers in the control and experimental groups has the same value – 3.36 points.

After completing training in the first year in the CG, this indicator increased to 3.41 points (by 0.05 points), and in the EG – up to 3.59 points (by 0.23 points), which is 0.18 points more than in control groups. It should be noted that according to the results of entrance control in the second, third and fourth courses, the average indicator (like all other indicators of students' readiness levels for professional self-realisation) in the EG was higher (3.54 points – 2 year; 3.56 points – 3 year; 3.69 points – 4 year) than in the CG (3.38; 3.4; 3.43 points, respectively), which is explained by the positive influence of our experimental methodology for training future education managers in experimental groups from the first year.

The dynamics of the average readiness indicator for future self-realisation of future education managers who continued to study in the second year was determined by the following digital data: In the CG, the average indicator increased from 3.38 to 3.4 points (by 0.02 points), and in the EG – from 3.54 to 3.66 points (1.12 points), which is 0.1 points better than in the control groups. In the third year, among future education managers who studied in the CG, the average readiness for professional self-realisation increased from 3.4 to 3.48 points (by 0.08 points), and in the EG from 3.56 to 3.73 points (0.17 points), which is 0.09 points higher than in the CG.

At the final stage of the experimental study (in the fourth year), the average index of readiness for professional self-realisation among students in the CG increased from 3.43 to 3.48 points (by 0.05 points), and in the EG from 3.69 to 3.95 points (0.26 points), which is 0.21 points better than in the CG. The dynamics of the average readiness of students for professional self-realisation, which was observed during the formative stage of the experiment, is shown graphically in Figure 1.

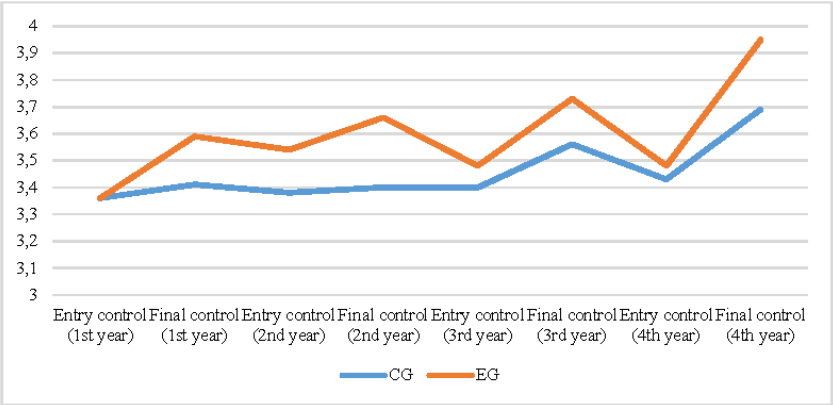


Figure 1: Dynamics of Changes of Average Indicator of Students' Readiness for Professional Self-Realisation

Since in the process of the formative stage of the experimental study, progressive dynamics of improving the results of the formation of readiness for future self-realisation of future

education managers who studied in control and experimental groups was observed, we analyse the generalised indicators from the beginning of the experiment (entry control in the first year) to its completion (final control in the fourth year), which is reflected in Table 2.

Table 2: The Generalised Results of the Forming Stage of the Experimental Study

Groups	Stage of control	Indicators of students' radiness for professional self-realisation								
		High (5 points)		Sufficient (4 points)		Satisfactory (3 points)		Low (2 points)		Average
		People	%	People	%	People	%	People	%	
CG	Entry control	2	1.79	40	35.71	66	58.93	4	3.57	3.36
	Final control	5	5.32	35	37.23	54	57.45	0	0	3.48
EG	Entry control	2	1.92	36	34.62	63	60.58	3	2.88	3.36
	Final control	19	20.65	49	53.26	24	26.09	0	0	3.95

Analysis of the table data allows to admit the effectiveness of our experimental methodology and its positive impact on the formation of readiness for future self-realisation of future education managers. Since the number of students in the CG and the EG constantly changed throughout the experimental study, we consider it appropriate to compare these data in percent, namely:

- In terms of high level indicators in the CG, there was an increase in such students from 1.79% to 5.32% (by 3.53%), and in the EG from 1.92% to 20.65% (by 18.73%), which is 15.2% more than in the control groups;
- In terms of a sufficient level in the CG, the number of students increased from 35.71% to 37.23% (by 1.52%), and in the EG from 34.62% to 53.26% (by 18.64), which 17.12% more than in control groups;
- In terms of a satisfactory level in the CG, the number of such students decreased from 58.93% to 57.45% (by 1.48%), and in the EG from 60.58% to 26.09% (by 34.49%), which is 33.01% better than in the CG;
- According to the low-level indicators in both categories of groups, upon completion of the formative stage of the experiment, there were no students with a significant increase in the level of readiness.

The dynamics of readiness indicators for future professional self-realisation of future education managers who studied in control and experimental groups is reflected in histograms (Figure 2).

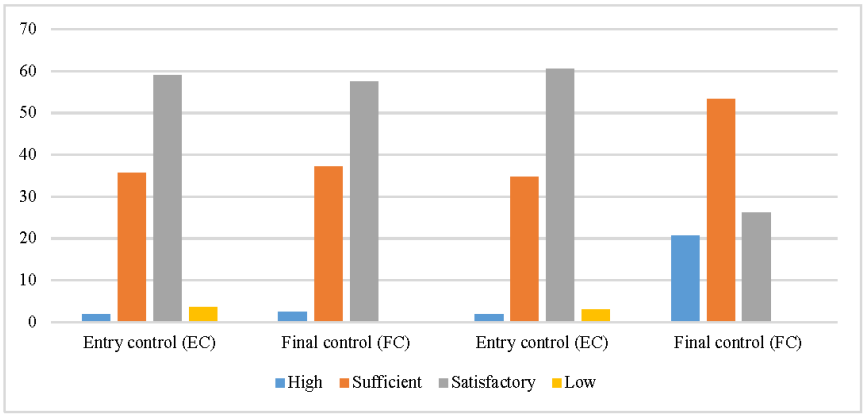


Figure 2: Dynamics of Readiness Indicators for Professional Self-Realisation of Future Education Managers who Studied in Control and Experimental Groups

In order to verify the reliability of the results and to formulate conclusions, we used methods of comparative analysis and mathematical statistics (cluster analysis) to process the results of a pedagogical experiment. The effectiveness of training future education managers of control groups was compared with the same indicators of students who studied in experimental groups. To analyse and generalise the results of our work, the essence of the null and alternative hypotheses of experimental research was determined. In the null hypothesis, it was suggested that the positive dynamics of the results of the professional training of future education managers who studied in control groups are a consequence of the natural learning process. An alternative hypothesis of our study was the assumption that the improvement in the results of professional training of students of experimental groups is determined by the targeted use of the proposed methodology for the formation of future managers of education readiness for professional self-realisation based on the acmeological approach.

In order to determine the reliability of the results of our study, we determined the F-criterion for the experimental groups (empirical criterion) and compared with the theoretical F-criterion. F-criterion we determined by the (Eq. 1):

$$F_{emp} = \frac{\sigma_1^2}{\sigma_2^2}, \tag{1}$$

where σ_1^2– variance at the input stage of determining the levels of readiness for professional self-realisation of future education managers; σ_2^2 – variance in the final control of the effectiveness of the formation readiness for professional self-realisation of future managers of

education on the principles of the acmeological approach at the final stage of the experiment. The dispersion is determined by the (Eq. 2):

$$\sigma^2 = \frac{\sum f(x_i - x)^2}{N}, \quad (2)$$

where *f* is the number of students whose grades 5, 4, 3, 2 reflect, respectively, high, sufficient, satisfactory, and low levels of readiness of future education managers for professional self-realisation based on the acmeological approach; $(x_i - x)$– the difference between the individual values of the estimates (5, 4, 3, 2) and the value of the average indicator for a certain group and stage of control; *N* is the number of students in those categories of groups (control or experimental) where the variance is calculated. The results of the calculation of the F-criterion are shown in Table 3.

Table 3: The Results of the Calculation of the F-Criterion

Group	Stage of control	Average grade	Indicators for the calculation of the F-criterion										F_{emp}
			f			$(x_i - x)$				$\Sigma f(x_i - x)^2$		σ^2	
			5	4	3	2	5	4	3	2			
CG	Entry control	3.36	2	40	66	4	1.64	0.64	-0.36	-1.36	37. 7143	0.3367	1.06
	Final control	3.48	5	35	54	0	1.52	0.52	-0.48	-1.48	33.4575	0.3559	
EG	Entry control	3.36	2	36	63	3	1.64	0.64	-0.36	-1.36	33.8365	0.3254	1.43
	Final control	3.95	19	49	24	0	1.05	0.05	-0.95	-1.95	42.7283	0.4644	

The analysis of Table 3 makes it possible to determine the following key indicators: In the control groups at the stage of input control, the dispersion (σ_1^2) is 0.3367, and at the stage of final control (σ_2^2) – 0.3559. Therefore, the F-test for control groups (F_{emp}-CG) has a value of 1.06. Calculations to determine the dispersion in the experimental groups showed that at the input control stage the dispersion (σ_1^2) is 0.3254, and the variance of the final control (σ_2^2) is 0.4644. the empirical indicator of the F-criterion for the experimental groups (F_{emp}-EG) is 1.43. To verify the reliability of these results, we compared the indicators of the empirical F-criterion (F_{emp}-CG and F_{emp}-EG) with the theoretical F-criterion (F_{erit}), the numerical values of which are given in the corresponding table. The indicator F_{erit} is established by the number of degrees of freedom, and in our study, it has a value from 111 (112 students of the CG at the stage of entrance control minus 1) to 91 (92 students of experimental groups at the stage

of final control minus 1). Provided that the number of degrees of freedom of the numerator will be in the range from 24 to infinity, and the denominator – from 60 to 120, the indicator F_{erit} will have values from 1.7 to 1.3.

Comparing the values of F_{emp}-EG with a standard indicator, its value of 1.43 is within the specified limits. This means that the results of our experimental study on the formation of the readiness of future education managers for professional self-realisation based on the acmeological approach are reliable and confirm the reliability of the experiment. The F_{emp}-KG indicator with a value of 1.06 goes beyond reliability, therefore, we believe that a slight increase in the level of readiness of future education managers for professional self-realisation, who studied in control groups, is associated with the conditions of the traditional learning process. Thus, it can be argued that the effectiveness of the formation of the readiness of future education managers for professional self-realisation depends on the targeted application of the proposed training methodology.

The observation showed that with a constant increase in the number of graduates, their employment level decreased from year to year, which is confirmed by the data in Table 4.

Table 4: The Proportion of Employed Graduates of 2014-2019

	Total	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
The Republic of Kazakhstan	87.2	94.7	92.7	92.1	90.9	85.6	70.4
The Republic of Lithuania	84.0	94.1	91.7	82.9	91.0	78.5	71.9

Note. Values are given as a percentage, % (Ņikišins, 2017).

Employment problems particularly intensified in 2018-2019, which reflects the difficult economic situation in this period both in countries as a whole and in individual regions. It should be noted that already in 2016, in the Republic of Lithuania the share of employed graduates decreased to 82.9% (by 8.8 percentage points), and this despite the increase in the total number of people employed in the Republic by 2.5 thousand people. (up to 1078.1 thousand people from 1075.6 thousand people in 2015). The rational and effective use of graduates involves, first of all, their employment in accordance with the speciality received at the university (the direction of training). In practice, this does not always happen, as can be seen from the data in Table 5.

Table 5: Employment of Graduates of 2014-2019 for the First Job Related to the Acquired Profession (Speciality)

	All graduates	Including				
		Higher education on programs for personnel of the highest qualification	Higher education on specialist programme and magisterium	Higher education on bachelor programme	Secondary vocational programs in training specialists of mid-level	Secondary vocational training programs for skilled workers, employees
The Republic of Kazakhstan	59.9	85.3	64.2	60.3	55.7	52.2
The Republic of Lithuania	59.7	100.0	62.8	75.8	51.9	48.7

Note. % of the total number of graduates of the corresponding level of education (Compiled by the authors).

The highest rates of employment for the first job related to the acquired profession (speciality) are among people with higher education in higher education programs. The level of employment of graduates of a specialist programme and a magistracy is slightly higher than that of a bachelor. It is noteworthy that graduates of secondary vocational educational institutions, especially in training programs for skilled workers, look less competitive in terms of employment compared to graduates with higher education. And this despite the numerous allegations of enterprise managers about the lack of skilled workers in the region's enterprises. The main problems faced by graduates in employment are reflected in Table 6.

Table 6: Structure of Graduates of 2014-2019 With Higher Education Based on Difficulties When Trying to Find Employment

	The Republic of Kazakhstan	The Republic of Lithuania
Lack of work experience	71.5	73.8
Non-compliance with qualification requirements (in the level of training, knowledge necessary to complete the work)	9.1	7.0
Could not find a job in the obtained profession (speciality)	23.5	16.6
Low wages offered	41.6	62.8
Lack of suitable jobs	27.2	28.2

Note. Values are given as a percentage, % (Compiled by the authors).

As follows from Table 6, the main problem with the employment of graduates is the lack of practical work experience, which in most cases is the main requirement for employers. The Republic of Lithuania as a whole is not very different from Kazakhstan in terms of employment problems for graduates, with the exception of wages. Almost 2/3 of graduates indicated its low level, which is much more than in Kazakhstan. Over the years, the average wage in the region is 56-58% of the average European level. And the salary of graduates of 2019 employed in the republic is about 2/3 of the average salary of young specialists employed outside the country.

5 Conclusions

In the course of the study, the tasks that contributed to the preparation of the future education manager for professional self-realisation have been solved: The parameters of educational and methodological support have been developed and tested, which contains authentic materials and a set of situational exercises to form readiness for professional self-realisation for future education managers; the methodology of vocational training of students for the purpose of their self-realisation during training has been specified; certain pedagogical conditions were realised according to the model for the formation of professional self-realisation of future education managers.

The formative stage of the experimental study envisaged a generalisation of psychological and pedagogical positions and achievements of advanced pedagogical experience and showed that the leading direction in the formation of readiness for professional self-realisation is the creation of such pedagogical conditions under which a student can take an active personal position and prove himself/herself to the greatest extent as a subject of educational activities and future specialist. Based on the analysis of the results of the experimental research, the dynamics of changes in the indicators of the levels of readiness for professional self-realization of students studying in the control and experimental groups from the first to the fourth year was compiled and recorded. The generalised indicators of the forming stage of the experimental have been analysed and the dynamics of the readiness indicators of future education managers for professional self-realisation who were trained in control and experimental groups, have been reflected in the histograms.

Our analysis indicates serious problems with the employment of university graduates both in the Republic of Kazakhstan and to an even greater extent in the Republic of Lithuania. To solve these problems, it is necessary to create a comprehensive mechanism for matching the needs of the economy in personnel with the scope and areas of professional training at universities, since the education system must adequately respond to the demands of the labour market. In our opinion, this problem cannot be shifted only to universities, it is necessary to more actively involve both employers and administration of the governments to solve it.

References

Agasisti, T. (2017). Management of higher education institutions and the evaluation of their efficiency and performance. *Tertiary Education and Management*, *23*(3), 187–190. https://doi.org/10.1080/13583883.2017.1336250

Alstete, J. W. (2006). Knowledge management and higher education: A critical analysis. *Knowledge Management Research & Practice*, *4*(3), 252–253. https://doi.org/10.1057/palgrave.kmrp.8500104

Altinay, F., Dagli, G., & Altınay, Z. (2017). Role of technology and management in tolerance and reconciliation education. *Quality & Quantity*, *51*(6), 2725–2736. https://doi.org/10.1007/s11135-016-0419-x

Al-Zawahreh, A., Khasawneh, S., & Al-Jaradat, M. (2019). Green management practices in higher education: The status of sustainable leadership. *Tertiary Education and Management*, *25*(1), 53–63. https://doi.org/10.1007/s11233-018-09014-9

Basari, G., & Altinay, Z. (2018). Tolerance, equality and access in all levels of education quality management. *Quality & Quantity*, *52*(2), 961–967. https://doi.org/10.1007/s11135-017-0550-3

Chen, Y., Daamen, T. A., Heurkens, E. W. T. M., & Verheul, W. J. (2019). Interdisciplinary and experiential learning in urban development management education. *International Journal of Technology and Design Education, 30*, 919–936. https://doi.org/10.1007/s10798-019-09541-5

Davies, J. L. (1992). Planning and management for excellence and efficiency of higher education. *Higher Education Policy*, *5*, 62. https://doi.org/10.1057/hep.1992.79

Degn, L. (2015). Sensemaking, sense giving and strategic management in Danish higher education. *Higher Education*, *69*(6), 901–913. https://doi.org/10.1007/s10734-014-9812-3

Guntzburger, Y., Pauchant, T. C., & Tanguy, P. A. (2017). Ethical risk management education in engineering: A systematic review. *Science and Engineering Ethics*, *23*(2), 323–350. https://doi.org/10.1007/s11948-016-9777-y

Haines, N. (1973). Education and the management of resources: An account of continuing education. *Higher Education*, *2*(2), 182. https://doi.org/10.1007/BF00137753

Kim, H., & Lee, Y. (2019). A structural model of customer relationship management (CRM) strategies, rapport, and learner intentions in lifelong education. *Asia Pacific Education Review*, *21,* 39–48. https://doi.org/10.1007/s12564-019-09583-3

Kuoppakangas, P., Suomi, K., Stenvall, J., Pekkola, E., Kivistö, J., & Kallio, T. (2019). Revisiting the five problems of public sector organisations and reputation management – the perspective of higher education practitioners and ex-academics. *International Review on Public and Nonprofit Marketing*, *16, 147–171*. https://doi.org/10.1007/s12208-019-00223-5

Kusainov, A. K. (2017). *Comparative pedagogy*. Prosveschenie Kazahstan.

Liubaretz, V.V. (2019). Didactic potential of the virtual educational environment and the possibilities of its practical implementation in managerial education. Bulletin of Mukachevo State University, *Pedagogy and Psychology*, *1*(9), 40–43.

Macheridis, N. (2018). Balancing authority and autonomy in higher education by implementing an agile project management approach. *Tertiary Education and Management*, *24*(2), 128–143. https://doi.org/10.1080/13583883.2017.1400092

McDonald, R. A. (2000). Reframing management education: A humanist context for teaching in business and society. *Interchange*, *31*(4), 385–401. https://doi.org/10.1023/A:1011007310120

Morozova, O., Nozdrenko, E., Zhukovskaya, L., & Kostylev, S. (2016). Management and art-management: Dimensions of conceptual interaction. *Economic Annals-XXI*, *158*(3-4), 61–65.

Nalivayko, T. E., & Granina, N. M. (2019). Didactic support of resource component for educational environment of higher learning institution for development of students' information literacy. *Smart Innovation*, *Systems and Technologies*, *138*, 664–677.

Ņikišins, J. (2017). Perceptions of social climate in the Baltic countries: Methodological and comparative issues. *Filosofija. Sociologija*, *28*(4), 257-267.

O'Donoghue, C., & Heanue, K. (2018). The impact of formal agricultural education on farm level innovation and management practices. *The Journal of Technology Transfer*, *43*(4), 844–863. https://doi.org/10.1007/s10961-016-9529-9

Pryshlyak, O. Y. (2018). Competence approach to multicultural training of specialists in the social sphere. Bulletin of Mukachevo State University, *Pedagogy and Psychology*, *2*(8), 113–117.

Riad Shams, S. M., & Belyaeva, Z. (2019). Quality assurance driving factors as antecedents of knowledge management: A stakeholder-focussed perspective in higher education. *Journal of the Knowledge Economy*, *10*(2), 423–436. https://doi.org/10.1007/s13132-017-0472-2

Shtyfurak, V. Y., & Shtyfurak, V. S. (2018). Psychological assistance in overcoming communicative barriers of future managers. Bulletin of Mukachevo State University, *Pedagogy and Psychology*, *1*(7), 263–269.

Teehankee, B. (2018). Critical realist action research and humanistic management education. *Humanistic Management Journal*, *3*(1), 71–90. https://doi.org/10.1007/s41463-018-0033-2

Teichler, U. (1995). Research on higher education and employment and its implication for higher education management. *Higher Education Policy*, *8*(1), 11–15. https://doi.org/10.1057/hep.1995.2

Tovkanets, O. S. (2019). Methods and techniques of creation of educational product and their role in formation of managerial competence of future teachers. Bulletin of Mukachevo State University, *Pedagogy and Psychology*, *2*(10), 102–106.

Urbani, C. (2020). Teacher continuing professional development and team-working competences: A case study from Italy. *International Journal for Research in Vocational Education and Training*, *7*(2), 237–255. https://doi.org/10.13152/IJRVET.7.2.6

Wei, S., & Liu, X. (2015). Institutionalized mutuality in Canada-China management education collaboration. *Frontiers of Education in China*, *10*(3), 356–383. https://doi.org/10.1007/BF03397075

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Digitalisation in Agriculture: Knowledge and Learning Requirements of German Dairy Farmers

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Abstract

Purpose: This study aims at investigating how digitalisation (in the sense of industry 4.0) has changed the work of farmers and how they experience the changes from more traditional work to digitalised agriculture. It also investigates what knowledge farmers require on digitalised farms and how they acquire it. Dairy farming was used as domain of investigation since it, unlike other industries, has strongly been affected by digitalisation throughout the last years.

Method: Exploratory interviews with 10 livestock farmers working on digitalised dairy farms were analysed using qualitative content analysis. A deductive and inductive coding strategy was used.

Findings: Farming work has changed from more manual tasks towards symbol manipulation and data processing. Farmers must be able to use computers and other digital devices to retrieve and analyse sensor data that allow them to monitor and control the processes on their farm. For this new kind of work, farmers require elaborated mental models that link traditional farming knowledge with knowledge about digital systems, including a strong understanding of production processes underlying their farm. Learning is mostly based on instructions offered by manufacturers of the new technology as well as informal and

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non-formal learning modes. Even younger farmers report that digital technology was not sufficiently covered in their (vocational) degrees. In general, farmers emphasises the positive effects of digitalisation both on their working as well as private life.

Conclusions: Farmers should be aware of the opportunities as well as the potential drawbacks of the digitalisation of work processes in agriculture. Providers of agricultural education (like vocational schools or training institutes) need to incorporate the knowledge and skills required to work in digitalised environments (e.g., data literacy) in their syllabi. Further studies are required to assess how digitalisation changes farming practices and what knowledge as well as skills linked to these developments are required in the future.

Keywords: Work-Based Learning, Organisational Change, Digital Competences, Qualitative Research, Digitalisation, Farming, Dairy, VET, Vocational Education and Training

1 Introduction

Digitalisation within professional contexts describes an ongoing process of introducing computerised technology with the aim of automatising work processes. To be more precise, the core quality of industrial digitalisation lies in the integration of software components as well as mechanical and electrical hardware parts that can exchange information over a network in order to add some kind of value, such as a flexible production system or reduced manpower requirements (Harteis, 2018). With the help of sensor technology, actuators, and elaborated software algorithms that are all integrated in a so-called cyber-physical system (CPS), it is possible to represent and manipulate working processes on computers in such a way that they can be automatised and controlled centrally from distance (e.g., Kagermann, 2015; see, for the agricultural context, Wolfert et al., 2017).

As with all technological changes in the past, it must be assumed that these digitalisation efforts have strong potential to transform the domain of work for many if not all employees (Frey & Osborne, 2017; see however Pfeiffer, 2018). The scenarios concerning this transformation discussed in the literature differ (Dworschak & Zaiser, 2014). While some scholars assume in the *automation scenario* that digital technology will replace all tasks now performed by humans—as long as it is not too complex to do so or if it is otherwise economically inefficient—others believe that work will mostly be relieved of menial or dangerous tasks, allowing humans to take over meaningful work requiring creativity or other kinds of cognitive capacity *(specialisation scenario)*. Besides these disagreements within the literature, however, consensus exists among a range of authors that digitalised workplaces will qualitatively change work practices and therefore also require knowledge and skills that are different from before (Al-Ani, 2017; Letmathe & Schinner, 2017).

Both scenarios similarly assume that manual work will largely be taken over by machines and only special cases will exist in which humans still have to engage in such tasks. It rather seems plausible that human workers are more often concerned with overseeing and controlling the systems in use. In other words, most of the time workers must mentally analyse and interpret data provided by the systems to make sense of it instead of physically manipulating tools and artefacts. This requires workers to be digitally literate—that is, being competent both to deal with computer systems that provide data as well as to use effectively the provided information units in meaningful and critical ways to manage production processes constructively (World Economic Forum, 2016).

In addition, workers need a better understanding of production processes at work instead of just being competent to engage in a particular set of concrete working tasks. Without good knowledge about how production is organised, how the different parts of the particular CPS are integrated with each other, and how the decision-making within the complex system is controlled by algorithms, it is hardly possible that workers are able to oversee and manage automatised production processes or to intervene in cases of problems and failure in a competent way (Harteis, 2018). Taken together, work seems to become more knowledge demanding and, while some knowledge components might not be needed any more, others that are related to the interaction with computer-based machinery and peripheral devices are asked for much more.

It remains, however, largely unknown how workers who are directly affected by digitalisation acquire the knowledge and skills required to deal with computerised working and production processes. Due to the cutting-edge nature of digitalisation it must be assumed that neither the current (vocational) education system nor existing further education courses are able to prepare workers adequately for what to expect in digitalised working environments (Harteis et al., 2019). It follows that especially the first generation of affected workers must develop the required knowledge through (non)formal and informal learning directly at work. The problem with this mostly experience-based learning is that it might not be very efficacious in the context of digitalisation because automatised work processes run hidden from their human end-users. As Billett (2018) argues, digitalised work can often not be experienced directly due to its opaque and abstract character. In the worst case, workers might not be able to construct appropriate mental models that help them to understand the systems in use. From an educational perspective this questions workers' professional agency since they are rendered ineffective to exercise control and to emancipate themselves effectively from external forces (Eteläpelto et al., 2013; Harteis, 2018; Goller, 2017). From a more technical perspective this could lead to the irony of automation describing workers as unable to respond effectively in cases where the digital system breaks down (Bainbridge, 1983).

Within the majority of work domains, efforts to digitalise production processes are either still in the planning phase or have just begun. In stark contrast, agriculture—and especially

livestock farming—was one of the first major industries affected by digitalisation efforts and many farmers can be described as pioneers in introducing integrated systems of sensors, actuators, and software algorithms to automatise working processes (Götz & Duda, 2018; Herlitzius, 2018; OECD, 2019). In fact, a high share of agricultural enterprises already employs this technology—often under the label of precision or smart farming (Eastwood et al., 2017)—to make use of available input resources both more efficiently and effectively (see e.g., Sponchioni et al., 2019). For instance, within the context of pig or cattle farming, automatised and individual feeding machines based on performance and health parameters help to reduce fodder requirements while producing the same or even higher yields. Another example is automatised gate systems that help to sort animals without the use of manpower. One of the strongest distributions of digital technology, however, has been recorded in dairy cattle farming (Vik et al., 2019). Besides the already described examples, it is the use of fully automatised milking robots as well as wearable sensors that allow a range of relevant health and performance data to be gathered and integrated within the herd management systems that are commonly utilised in this context (OECD, 2019).

In general, most discussions around the effects of digitalisation on the world of work are led either on speculative grounds or very general forecasts regarding job profiles (e.g., Frey & Osborne, 2017). It is because of the cutting-edge character of the digitalisation in most domains that almost no empirical studies exist about how the change from more traditional to digitalised work is experienced by workers, what knowledge is required, and how it is learned (see, however, Fischer et al., 2018). And although the agricultural domain has been affected by this digitalisation, only a few empirical studies shed light on these open issues (Butler et al., 2012; Holloway et al., 2014; Vik et al., 2019). These studies, conducted mainly in Norway and the UK, found the first evidence that digital farming increases flexibility during the working day, requires more technical knowledge and skills, and also changes the quantitative and qualitative relationship between farmers and their animals. Unfortunately, no comparable findings exist for the German context although it is one of the main agricultural producers in the European Union. In addition, studies adopting an educational perspective on digitalisation trends in farming are completely missing.

The aim of this study is to address this research gap with an explorative study in the context of German dairy farming. To be more concrete, several interviews with farmers whose farms have undergone considerable digital change were conducted to answer the following research questions:

(1) How do farmers experience the changes from more traditional work to digitalised agriculture?

(2) What knowledge do farmers require on digitalised farms and how do they acquire it?

By answering these research questions this study significantly adds to the existing literature about the effects of digitalisation of farming from an educational perspective, especially by taking the German context into account. The next section will describe the methodology underlying this study, including the materials used. It is followed by a description and discussion of the findings.

2 Materials and Method

To answer the research questions this study used an explorative interview approach. To find potential interview participants, a wide range of dairy farms in the north of North Rhine-Westfalia and the south of Lower-Saxonia in Germany were contacted via phone and mail. Criterion for potential inclusion into the sample was that the farms—the participants work at—introduced at least some kind of digitalisation in the last years that resulted in automatised work processes as described in the theoretical part of this contribution. In sum, 10 farmers (1 female) from nine different dairy farms that met this criterion agreed to take part in the study (convenience sample). Both the size of the farms (on average 145 dairy cattle, *Min* = 60, *Max* = 400) and their commercial organisation mode (mostly family owned) are quite typical for Germany (FMFA, 2016). All interview partners held at least a vocational farming degree, while a few even earned some kind of university qualification (mostly Bachelor level). Most farms had installed fully automatised milking robots ($k = 6$) or at least automatised milk analysis technique ($k = 8$) as part of their digitalisation strategy a few years ago. In addition, automatic scrapers and floor cleaning robots, automatised feeding machines, heat identification sensors, calving monitoring, and automatised gate systems were in use on some but not all farms. On most farms these technologies are interconnected via intranet or internet and make use of a centralised farm management system. All interview participants were familiar with both traditional and digitalised farming work.

The interviews were conducted using a semi-structured interview guideline containing open questions regarding how the farming practice had changed due to the digital equipment introduced, the changed knowledge and skill requirements, as well as how the necessary knowledge and skills were acquired. On average the interviews took about 50 minutes (*SD* = 24:30 minutes). After obtaining consent from participants, all interviews were recorded and subsequently transcribed verbatim. The more than 50,000-word-long transcripts were then analysed using qualitative content analysis based on the recommendations outlined in Kuckartz (2014) and Schreier (2012). In a first step, a combined deductive and inductive coding strategy was used to structure the interview material employing the following main categories (see Table 1): (a) *Digitalisation at the farm*, (b) *Changes of farming practice*, (c) *Knowledge requirements*, and (d) *Learning modes*. The transcripts were parallelly coded by the first two authors. In a second step, all coding discrepancies were discussed. Using a consent

approach, it was decided which category to use. In the third step the first author paraphrased all remaining 317 codings and then summarised each coding in a single short proposition. These propositions were then used for extracting the main themes emerging from the interview material that will be reported and discussed below.

Table 1: Categories Used in Qualitative Content Analysis

Main Category	Definition
(a) Digitalisation at the farm	All kinds of descriptions concerning what digital technology was introduced at the farm and why.
(b) Changes of farming practice	All kinds of descriptions concerning how farming practices and work processes changed due to the digital technology introduced at the farm (new tasks, ceased tasks, qualitative change of tasks, changes concerning the relationship to livestock).
(c) Knowledge requirements	All kinds of descriptions about knowledge and skills that are required to cope with the new digital technology at the farm as well as descriptions that contrast competence requirements before and after digitalisation.
(d) Learning modes	All kinds of description of how the competences required to engage with digital farming technology has been or is acquired.

3 Findings

3.1 Changes Induced by Digitalisation

All participants reported extensively and enthusiastically about the digital technology they are using on their farms. The changes induced by digitalisation were strongly associated with a new and desirable mode of working on their farms. Daily work routines on digitalised farms were described as less physically demanding and as requiring less time to be spent within the cowshed. To be more precise, it is the manual and labour-intensive milking process especially that has now been taken over by milking robots; as well, the frequent on-site monitoring of cattle is now being done by sensor technology (e.g., checking whether a cow has eaten). In general, farmers reported that they now have less direct contact with their livestock on the farm. Animals have only to be checked upon if indicated by the digital system (e.g., because of unusual sensor data). In relation to this, work is now described as less dirty and less strenuous. In general, these changes were experienced as a positive development by the interview participants.

Instead of the more manual work, farmers have now to engage more often in tasks that can best be described as monitoring and controlling the technology in use. To be more precise, farmers now spend a substantial part of their day analysing data reported by different sensors available in their equipment (e.g., amount of milk given or certain health parameters, etc.) and putting in new data required by the system (e.g., certain medication that lets the system

know that the milk of a particular cow cannot be further processed). Data analysis is mostly done by focussing on deviations from established norms or historical records (e.g., quantity or composition of milk). This way, cattle can be identified that might be ill or that show other unusual tendencies (e.g., being in heat or pregnant) and that require the farmer to take certain measures. Both data analysis and data input are done using either personal computers or mobile devices like smartphones and tablets.

> For example norm deviances regarding physical activity. A cow has a certain amount of walking that it usually does. And if she is in heat, she is excited, has a different kind of rhythm suddenly. And this more of physical activity that I get on the computer in form of a graph. Graphs or plain numbers, but graphs are better, because there I see peaks immediately and know "Ah, that is where I need to pay attention". (Interview 5)

In regard to the digital technology used at the farms, the interviewees agreed that both maintenance and cleaning of the machines are also part of their regular work. However, it was emphasised that maintenance is constrained to mechanical issues like changing wearing parts. In contrast, problems with the built-in electronics or software were described as out of the scope of their capacities. If such issues occur the farmers need to get help from external service technicians. Usually this maintenance service is provided by the manufacturer of the technology in use.

Work on digitalised farms was described as affording more temporal and geographic flexibility. The reasons for this increased flexibility lie in the interconnection of different sensors, machinery such as robots, and computers within a single system that allow to monitor and control farm equipment as well as working processes remotely. Using a computer or smartphone has made it possible for farmers to access data and to steer machinery without being present on site. The highest degree of flexibility is linked to autonomous milking robots that are being used at the farms. In this case, the daily work schedule is no longer determined by the cattle's need to be milked for two hours, once in the morning and once in the evening. This newly gained time and the new degrees of freedom can be used for other duties or even for recreational purposes.

At the same time, the farmers emphasised that the digital technology requires them to be always online. They are required to make sure that they are constantly connected to their digital system and able to react in the case of technical problems indicated by that system. This is the only way the farmers can ensure smooth operating of their farms. This 24/7 type of on-call duty was experienced as unpleasant and stressful by some of the interview partners.

> [T]his pressure to be always on duty, this level of on-call duty, that you have to have, that is indeed psychologically stressful. The physical strains are less […] but the psychological stress is much more. […] And because of this digitalisation step we have taken, it is like this, that you always check "Ok, do I have my mobile phone? Do I have enough battery? Is it possible that the system can reach me? Am I online?" And this, sure that is like, that you can never "switch off". That is definitely a critical issue. The other side of the coin. But actually, the advantages prevail, that is why I accept it. (Interview 6)

Besides the disadvantages described and experienced by the farmers, not one of the interview partners considered going back to a non-digitalised farm. Digitalised farming was perceived as easier, more diverse, and more flexible work, and even more interesting, especially for those farmers who showed some kind of technical affinity.

3.2 Knowledge Requirements

Farmers working in digitalised environments still need a strong background of agricultural basics like nutritional requirements of cattle, symptoms of diseases, or typical care procedures. At the same time, the interviewees emphasised that knowledge and skills connected to the use of computers and other kinds of mobile digital devices have been gaining importance. In general, it has been argued that farmers working on digital farms require some kind of basic understanding of how technology works to take care of the tasks and problems at hand.

> Yes, one should be computer literate and probably also be able to use touch technology. […] Yes, it is not an easy job any more as it used to be, now anything is done by machines, so you need some understanding of these machines and how to work the machines. (Interview 8)

Moreover, the relevance of knowledge and skills connected to the extraction, interpretation, and usage of data provided by the different sensors on their farms was described as highly important. Farmers are required to be able to distinguish relevant from less relevant data and to interpret data in reference to established norms of certain parameters and/or changes occurring over time. To do so, the data and information provided by the digital system need to be integrated with more traditional knowledge about farming processes or animals.

> If the cow deviates from its normal parameters, that I want to know. I am not interested whether it has slept 6 or 8 hours. I just want to know if she behaves somehow abnormally. Is there something different than usual? And then I can see this and draw my conclusions. What's happening? Why is she behaving like this? Sure, that, of course, requires experience. […] And for instance, if I have taken care of their claws then the cows are a little bit confused, then the system is not helping. The parameters provided by the system will change due to this disturbance. That is why I must not over interpret the parameters on such days. (Interview 5)

3.3 Learning Modes

Most interviewees described that the knowledge and skills required to use the digital systems on their farms had not been covered or were only marginally covered in their initial (vocational) education. Instead, the predominant modes to acquire this body of knowledge were on-site training provided by the manufacturer of the digital farming technology as well as experiential and other informal learning activities. First, all interview partners reported that the manufacturers of the larger machines like milking robots provided a short but intense training period after the technology was bought and installed. That training was usually one to two days long; a trained service technician would spend the full 24 or 48 hours on the farm, instructing the farming staff on how to operate the technology and jointly working with the farmers to enable them to use the machines and computers in the context of their own farms. Only in a few instances was it reported that manufacturers or other training providers offered longer and more formalised learning opportunities. After the initial on-site training, learning was mostly experience-based. However, other learning opportunities emerged from reading professional literature like manuals or internet resources, and from discussions with befriended farmers that were usually related to some kind of trouble shooting.

> I would say it like this, one gets the first instructions from the ones, that sells it to you or in the case of our milking robot, for instance, there was this additional person, when we switched, he was being here, he explained everything. The cattle had to be used to it and then he was here 24 hours, the full time, and he explained everything. (Interview 1)

Insights about the technological innovations existing in the farming domain and how such technology can be used were acquired through reading farming journals for practitioners, visiting trade fairs, or speaking with other farmers who had already digitalised their businesses.

4 Discussion

This section sets out to discuss the findings. For this purpose, the first two subsections answer the research questions that guided this study: (a) How do farmers experience the changes from more traditional work to digitalised agriculture? and (b) What knowledge do farmers require on digitalised farms and how do they acquire it? It is followed by a short discussion of relevant limitations underlying the empirical work conducted.

4.1 Experience of Digitalisation

Digitalisation has changed farming from an occupation that was characterised by manual work involving mechanical tools into one that requires symbol manipulation using highly automatised digital technology. In particular, it is the more menial and physical demanding tasks that are taken over by machines (see, for similar findings, Butler et al., 2012; Vik et al., 2019). Instead, farmers have to work more often now with computers that allow them to monitor and control these systems. This work can be described as mostly cognitive rather than manual. In this way, the changes triggered by digitalisation can be interpreted as predicted in the *specialisation scenario* described above (see also Dworschak & Zaiser, 2014). On the other hand, this is only true for trained staff or the owners of the farms. Farming aides, especially those without education who are appointed to manual routine tasks, may subsequently lose their jobs to machines. This can then be interpreted as evidence for the *automation scenario*. Taken together, these findings speak in favour of ideas put forward by Frey and Osborne (2017): Digitalisation leads to a loss of jobs formerly held by mostly low-educated staff and requires the remaining more capable workers to engage in more cognitively demanding work.

Another change in the daily work of farmers concerns the frequency with which they are in direct contact with their cattle, as also described by Butler et al. (2012) and Holloway et al. (2014). Due to shifts of tasks that require working with computers, farmers spend less time in the cowshed together with their livestock. In other words, digitalised work becomes more abstract and less concrete. Some authors would interpret this as a first sign of potential tendencies of alienation, where farmers might lose the connection to their cattle and the foundations of their work that then leads to a potential loss of meaning and identity (Holloway et al., 2014). At the same time, however, most farmers reported that they had the feeling that the new technology gives them an even deeper insight into their farms which helps them further to understand their livestock. The additional data bring them closer to their animals than they have ever been before. This speaks against potential tendencies of alienation.

In line with the findings reported by Butler et al. (2012) and Vik et al. (2019), all interview participants emphasised that the new technology has afforded them a greater degree of freedom to decide when to work and from where to work (see also Steeneveld et al.,

2012). This flexibility is gained mostly from the automation of processes as well as from new opportunities to monitor and control incidents at the farm remotely. In general, this new way of working is perceived as something desirable since it allows more self-determination and work-life balance. Nevertheless, this flexibility comes with a greater need of being constantly online so that the CPS may contact the farmer in the face of unexpected events or failure. Some farmers experience this requirement to be constantly on call as stressful (see also Butler et al., 2012). Within the digitalisation literature this phenomenon has been described as blurring boundaries of the private and professional spheres (Harteis, 2018). At the same time, one has to acknowledge that farming always has been an occupation where the private and professional spheres have been strongly intertwined.

4.2 Knowledge Requirements and Learning

Farmers need to be literate to use computer technology and to engage in a range of data-related tasks. However, computer and data literacy as such are not sufficient. To realise the potential of the digital technology effectively and efficiently, farmers need to integrate knowledge of how digital systems of interconnected machinery and sensors work, including how to analyse the provided data with professional farming knowledge. They need to construct mental models that allow them to decide what data are relevant and how they are generated by what sensors, how reliable the generated information usually is, and how it connects with real-world phenomena of their livestock. Without such elaborated and fitting mental models, farmers might not use the full capacity of their digital system or—in the worst case—might make uninformed if not poor decisions, negatively affecting their cattle and business (after all, the data provided by digital systems ought to support decision-making: Ayre et al., 2019).

Apart from that, and in line with the general literature on digitalisation of work (Harteis, 2018), farmers need a good understanding of all production processes on their farm. Such knowledge is required to understand what data are automatically collected by the digital system through sensor technology and what data must be gathered in some other way. For instance, although certain illnesses can be detected using milk parameters, others do not manifest this way. It follows that farmers have to understand what data are collected, what conclusions can be drawn from the available data, and what additional data are required to assess the health of livestock. At the same time, farmers need to know about symptoms of health-related issues that can not be detected using the sensors in use but might only manifest themselves in sensual experiences (sounds, looks, smell etc.). A similar phenomenon has been reported in studies with mechanics and truck drivers that heavily rely on listening to the sound of machinery or engines to diagnose problems (Bauer et al., 2006; Lewis, 2011). Such often implicit knowledge is usually acquired through long-lasting contact with cattle that allows building up experiential knowledge structures that represent how healthy

and less healthy cows look and behave (Boshuizen et al., 2020). The question of whether such knowledge can be sufficiently constructed in settings in which farmers have less and less direct contact with their livestock remains open. In the worst case, the predicted irony of automation (Bainbridge, 1983) might become reality in which farmers are not able to respond appropriately to particular issues on their farm, since digitalisation would have deprived them of drawing on relevant experiences that are compiled in implicit knowledge structures (see also Billett, 2018).

In addition, farmers need to know about issues that affect the processes on their farms. A typical example is when a cow gets antibiotics and its milk must therefore not be processed any further. In such cases the farmer needs to inform the CPS about this fact, otherwise the milk of the affected cow is put into the general tank and might spoil the whole daily yield. Without knowledge of how the production process is structured, this could lead to relevant financial losses for the farmer and health-related risks for their customers.

So how do farmers learn the knowledge and skills required to work in digitalised farming environments? First of all, all the farmers in this study had completed at least some vocational farming degree and had some years of experience in traditional livestock farming. So, they could all build upon a strong foundation of farming knowledge. At the same time, it was reported that their education did not cover the use of digital systems, or only in a very limited way. The knowledge and skills required to work with the machines were then mostly acquired through short instructions provided by the manufacturer of the technology, through daily experience, through reading codified information, and through discussions with other farmers. The relevance of peer-to-peer communication in the context of digital farming has already been emphasised by Kernecker et al. (2020). However, the former learning mode especially has to be assessed quite critically from an educational perspective. Whether the manufacturer really has an incentive to empower farmers to use the system they were sold in an independent way remains open for speculation. After all, it is normal practice to sell farmers maintenance services. In the worst case, it could be argued, farmers are intentionally tied to a single manufacturer with the aim to purchase services continuously from the very same company. From an educational perspective, this is largely undesirable since farmers might lose their professional sovereignty.

4.3 Limitations

The following limitations should be taken into account when interpreting the findings of this study: (a) Only 10 interview partners agreed to take part in this study, although a larger number of farmers had been invited. It remains unclear whether the farmers who did not agree to being interviewed would have answered differently due to different experiences with or different attitudes towards digitalisation. From our perspective, a relatively high risk exists

that farmers who participated in this study were satisfied with the changes on their farms and felt rather competent with the digital technology in use. (b) Furthermore, the sample has to be described as rather small and all farmers were located in a part of Germany that has generally been quite open and welcoming to technological change in the recent past. It therefore remains open how generalisable the findings are either to the German context or the international one. (c) The interview participants all work on farms that are average size for the German context. It is therefore open how the findings might hold for small or very large farms.

5 Conclusion

The introduction of digital technology was perceived as something positive by the affected farmers: Work has become less menial and more flexible, and it allows for a better work-life balance due to a shift from manual tasks towards work that comprises mainly symbol manipulation and data interpretation. At the same time, however, the new technology requires farmers to be permanently on duty, which was sometimes described as stressful. It follows that farmers should be aware of both the positive effects of the introduction of digital technology on their farms and also the potential risks connected to the change.

The successful management and operation of digitalised farms requires farmers to construct elaborated mental models that contain traditional farming knowledge, a strong understanding of the production processes at their farm, and technological literacy. It is only such integrated knowledge that allows them to make full use of the new technology. It remains open how younger farmers, especially those who have not experienced traditional farming, build up such mental models. It is therefore required that both vocational and academic schools appropriately cover traditional as well as digital farming and that they help students to make the necessary connections between these knowledge domains. A stronger coverage of digital technology within farming degrees should also help farmers to remain more independent of manufacturers. A strong understanding of digital technology will help farmers to assess critically the services offered by manufacturers and consequently to maintain their professional sovereignty.

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References

Al-Ani, A. (2017). CPS and the worker: Reorientation and requalification? In S. Jeschke, C. Brecher, H. Song & D. B. Rawat (Eds.), *Industrial internet of things: Cybermanufacturing systems* (pp. 563–574). Springer.

Ayre, M., Mc Collum, V., Waters, W., Samson, P., Curro, A., Nettle, R., Paschen, J.-A., King, B., & Reichelt, N. (2019). Supporting and practising digital innovation with advisers in smart farming. *NJAS - Wageningen Journal of Life Sciences*, 90–91. https://doi.org/10.1016/j.njas.2019.05.001

Bauer, H. G., Böhle, F., Munz, C., Pfeiffer, S., & Woicke, P. (2006). *Hightech-Gespür: Erfahrungsgeleitetes Arbeiten und Lernen in hoch technisierten Arbeitsbereichen. Ergebnisse eines Modellversuchs beruflicher Bildung in der chemischen Industrie* [Hightech sense: Experience-led work and learning in high technology work domains. Results of a pilot project in VET in the chemical industry]. Bertelsmann.

Bainbridge, L. (1983). Ironies of automation. *Automatica*, *19*(6), 775–779. https://doi.org/10.1016/0005-1098(83)90046-8

Billett, S. (2018). Accessing and securing conceptual and symbolic knowledge required for digital era work. In C. Harteis (Ed.), *The Impact of Digitalization in the Workplace* (pp. 197–212). Springer. https://doi.org/10.1007/978-3-319-63257-5_13

Boshuizen, H. P. A., Gruber, H., & Strasser, J. (2020). Knowledge restructuring through case processing: The key to generalise expertise development theory across domains? *Educational Research Review*, *29*. https://doi.org/10.1016/j.edurev.2020.100310

Butler, D., Holloway, L., & Bear, C. (2012). The impact of technological change in dairy farming: Robotic milking systems and the changing role of the stockperson. *Journal of the Royal Agricultural Society of England*, *173*, 1–6.

Dworschak, B., & Zaiser, H. (2014). Competences for cyber-physical systems in manufacturing – First findings and scenarios. *Procedia CIRP*, *25*, 345–350. https://doi.org/10.1016/j.procir.2014.10.048

Eastwood, C., Klerkx, L., & Nettle, R. (2017). Dynamics and distribution of public and private research and extension roles for technological innovation and diffusion: Case studies of the implementation and adaptation of precision farming technologies. *Journal of Rural Studies*, *49*, 1–12. https://doi.org/10.1016/j.jrurstud.2016.11.008

Eteläpelto, A., Vähäsantanen, K., Hökkä, P., & Paloniemi, S. (2013). What is agency? Conceptualizing professional agency at work. *Educational Research Review*, *10*, 45–65. https://doi.org/10.1016/j.edurev.2013.05.001

Fischer, C., Goller, M., Brinkmann, L., & Harteis, C. (2018). Digitalisation of work: Between affordances and constraints for learning at work. In D. Ifenthaler (Ed.), *Digital Workplace Learning* (pp. 227–249). Springer International Publishing. https://doi.org/10.1007/978-3-319-46215-8_13

Federal Ministry of Food and Agriculture. (2016). *Betriebe mit Milchkuhhaltung nach Bestandsgrößenklassen* [Farms with dairy cattle—Herd size classes]. FMFA. https://www.bmel-statistik.de/landwirtschaft/tierhaltung/rinderhaltung/

Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change*, *114*, 254–280. https://doi.org/10.1016/j.techfore.2016.08.019

Goller, M. (2017). *Human agency at work: An active approach towards expertise development*. Springer VS.

Götz, K.-U., & Duda, J. (2018). Methoden und Potenziale der Datenverarbeitung – Umsetzungsstrategien Tierhaltung, Tierernährung und Tierzüchtung [Methods and potential of data processing – Application strategies livestock farming, livestock feeding, and livestock breeding]. In H. Wilhem Schaumann Stiftung (Eds.), *27. Hülsenberger Gespräche 2018. Landwirtschaft und Digitalisierung* (pp. 132–137). H. Wilhelm Schaumann Stiftung.

Harteis, C. (2018). Machines, change and work: An educational view on the digitalization of work. In C. Harteis (Ed.), *The impact of digitalization in the workplace* (pp. 1–10). Springer. https://doi.org/10.1007/978-3-319-63257-5_1

Harteis, C., Goller, M., & Fischer, C. (2019). Die Auswirkungen der Digitalisierung auf die Bedeutung beruflicher Qualifikation aus betrieblicher Sicht. In J. Seifried, K. Beck, B.-J. Ertelt, & A. Frey (Eds.), *Beruf, Beruflichkeit, Employability* (pp. 239–253). wbv.

Herlitzius, T. (2018). Landtechnikentwicklung im Digitalisierungshype – "Evolutionär oder Disruptiv?" [Development of agricultural technology as digitalisation hype – "Evolutionary or disruptive?"]. H. Wilhem Schaumann Stiftung (Eds.), *27. Hülsenberger Gespräche 2018. Landwirtschaft und Digitalisierung* (pp. 30-38). H. Wilhelm Schaumann Stiftung.

Holloway, L., Bear, C., & Wilkinson, K. (2014). Robotic milking technologies and renegotiating situated ethical relationships on UK dairy farms. *Agriculture and Human Values*, *31*(2), 185–199. https://doi.org/10.1007/s10460-013-9473-3

Kagermann, H. (2015). Change through digitization—Value creation in the age of industry 4.0. In H. Albach, H. Meffert, A. Pinkwart, & R. Reichwald (Eds.), *Management of permanent change* (pp. 23–45). Springer. https://doi.org/10.1007/978-3-658-05014-6_2

Kernecker, M., Knierim, A., Wurbs, A., Kraus, T., & Borges, F. (2020). Experience versus expectation: Farmers' perceptions of smart farming technologies for cropping systems across Europe. *Precision Agriculture*, *21*(1), 34–50. https://doi.org/10.1007/s11119-019-09651-z

Kuckartz, U. (2014). *Qualitative text analysis: A guide to methods, practice & using software*. SAGE.

Letmathe, P., & Schinner, M. (2017). Competence management in the age of cyber physical systems. In S. Jeschke, C. Brecher, H. Song, & D. B. Rawat (Eds.), *Industrial internet of things: Cybermanufacturing systems* (pp. 595–614). Springer.

Lewis, J. C. (2011). *Dynamic integrated learning: Managing knowledge development in road transport* [Doctoral dissertation, Griffith University].

Organisation for Economic Co-operation and Development. (2019). *Digital opportunities for better agricultural policies*. OECD Publishing.

Pfeiffer, S. (2018). The "Future of Employment" on the shop floor: Why production jobs are less susceptible to computerization than assumed. *International Journal for Research in Vocational Education and Training*, *5*(3), 208–225. https://doi.org/10.13152/IJRVET.5.3.4

Schreier, M. (2012). *Qualitative content analysis in practice*. SAGE.

Sponchioni, G., Vezzoni, M., Bacchetti, A., Pavesi, M., & Renga, F. M. (2019). The 4.0 revolution in agriculture: A multi-perspective definition. *Proceedings of the XXIV Edition*, 143–149.

Steeneveld, W., Tauer, L. W., Hogeveen, H., & Oude Lansink, A. G. J. M. (2012). Comparing technical efficiency of farms with an automatic milking system and a conventional milking system. *Journal of Dairy Science*, *95*(12), 7391–7398. https://doi.org/10.3168/jds.2012-5482

Vik, J., Stræte, E. P., Hansen, B. G., & Nærland, T. (2019). The political robot – The structural consequences of automated milking systems (AMS) in Norway. *NJAS - Wageningen Journal of Life Sciences*, 90–91. https://doi.org/10.1016/j.njas.2019.100305

Wolfert, S., Ge, L., Verdouw, C., & Bogaardt, M.-J. (2017). Big data in smart farming – A review. *Agricultural Systems*, 153, 69–80. https://doi.org/10.1016/j.agsy.2017.01.023

World Economic Forum. (2016). *The future of jobs. Employment, skills and workforce strategy for the fourth industrial revolution*. http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf

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Apprentices' Resources at Work and School in Switzerland: A Person-Centred Approach

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Abstract

Context: Providing learners with quality resources at work and school is a key element of apprenticeships and is essential for developing vocational competencies and successful vocational careers. Drawing on previous research on situational and personal resources, we first explored work-related and school-related resource profiles of apprentices' learning environments. We further analysed how core self-evaluations are linked to resource profiles and examined whether learners' apprenticeship satisfaction and occupational commitment varied according to the resource profiles.

Approach: We used latent profile analysis and multinomial logistic regressions, applying an integrative, person-centred approach. Our data came from the Swiss longitudinal study "Transition from Education to Employment" (TREE). The sample consisted of 1,185 apprentices enrolled in the second year of their apprenticeship.

Findings: We found four profiles of situational resources (e.g., instruction quality, climate, learning opportunities, autonomy, and demands) at the two learning locations. The profiles embodied different patterns and levels of situational resources. Two profiles were characterised by overall high or average levels of situational resources at both learning locations; the other two illustrated a stark contrast between the resources provided in the workplace and at school. Learners with higher core self-evaluations were more likely to be in profiles with

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higher situational resources. Apprentices in more beneficial profiles were more satisfied with their apprenticeships and more committed to their occupations than those in profiles with lower resources.

Conclusion: The results confirm the importance of providing apprentices with challenging, empowering, and supportive learning environments in the workplace and at vocational schools. To support learning and positive career development in apprenticeships, educators should strengthen learners' core self-evaluations to empower them to shape their learning according to their needs.

Keywords: Apprenticeship, Resources, Core Self-Evaluation, Satisfaction, Commitment, VET, Vocational Education and Training

1 Introduction

It is well known that learners with high situational resources (e.g., supportive colleagues and tasks that stimulate learning) and personal resources (e.g., self-efficacy) learn more and faster (Corney & du Plessis, 2010; Zimmerman, 2000) and fare better in their careers (Stalder & Lüthi, 2020; Taris & Feij, 2004). Educators in vocational education and training programmes, researchers, and policy makers thus agree that all learners should be provided with favourable learning conditions, including plentiful learning opportunities or sufficient guidance and support (Filliettaz, 2011). This discussion pays increased attention to developing vocational programmes that strengthen links between school-based and workplace learning experiences (Evans et al., 2011; Mulder, 2019; Schaap et al., 2011), such as apprenticeship-based programmes, which combine workplace and vocational school learning (Fuller & Unwin, 2011; Markowitsch & Wittig, 2020).

Apprenticeships have been praised as optimal pathways for preparing young people for qualified work, smoothing school-to-work transitions, and promoting the development of vocational competence and occupational identity (European Union, 2016; Markowitsch & Wittig, 2020). However, research also has highlighted the potential weaknesses and challenges of apprenticeships, such as restricted learning opportunities in the workplace or at school (Fjellström, 2014; Fuller & Unwin, 2004; Stalder & Schmid, 2016), a lack of cooperation between schools and companies (Gessler, 2017), and poor matches between workplaces and school curricula (Aarkrog, 2005), resulting in an insufficient alignment of what is taught, trained, and learned. This raises important questions about how learning in apprenticeships is organised, what learning resources are provided in workplaces and vocational schools, and how learners' personal resources contribute to gaining and utilising such resources for their learning. Particular challenges of apprenticeships are that methods of competence development are organised differently at work and in school (Mulder et al., 2015; Schaap et al., 2011), that

situational resources often vary considerably within and between work and school (Fuller & Unwin, 2004; Stalder & Schmid, 2016), and that situational and personal resources are intertwined (Mikkonen et al., 2017). Apprentices must adapt to and profit from the learning provisions of both locations (Akkerman & Bakker, 2012), and learners with higher personal resources might be more apt to shape their environments and more capable of handling conflicting interests between school and work.

Although many studies about learning conditions in vocational programmes exist, previous research has often focused on resources in the workplace, whereas research looking at apprentices' vocational school resources is still rare (Schaap et al., 2011). This runs counter to the assumption that resources from both learning locations, together with personal resources, are crucial for apprentices' vocational development (Mulder et al., 2015; Powers & Watt, 2021; Stalder & Lüthi, 2018). Moreover, previous research tended to explore specific occupational domains (Chan, 2013; Fjellström, 2014), the learning situations of adult learners (Powers, 2020), and countries, where school-based vocational programmes are predominant and apprenticeships include smaller groups of learners (Ferm, 2021; Reegård, 2018). The investigated samples might not represent the full variation of apprentices' learning situations, individual skills, and learning potentials, resulting in findings that might limit generalisability. To address these issues, this study is based on a large sample of apprentices in Switzerland, where about two thirds of all young people enrol in apprenticeships and programmes with all levels of intellectual demands are offered in all occupational sectors (Stalder, 2011; State Secretariat for Education, 2018).

In this study, we drew on the conservation of resources (COR) theory (Hobfoll et al., 2018) to propose that workplace and school resources should be joined to analyse unique resource patterns within and across learning environments, that learners' resources impact their learning environments, and that those environments, in turn, influence learners' attitudes towards their apprenticeships. We addressed these issues by exploring second-year apprentices' situational and personal resources, including a series of task-related, social, and organisational/institutional resources that have been shown to be relevant for vocational competence development (Mikkonen et al., 2017; Nisula & Metso, 2019) and a key personal resource, core-self evaluations (Judge et al., 2003), the potential of which to shape job environments has been widely acknowledged (Judge & Kammeyer-Mueller, 2011). Finally, we investigated whether and how being in a certain resource pattern affects two of learners' key attitudes: Apprenticeship satisfaction and occupational commitment (Messmann & Mulder, 2015; Nägele & Neuenschwander, 2014).

In sum, this paper makes four key contributions. First, we contribute to the emerging literature on learning in different environments of initial vocational education and training (IVET) by analysing the levels of situational resources in the workplace and vocational schools and by exploring how resources are interlinked within and across the two learning locations.

Second, we address the call to advance knowledge by determining how learners' personal resources affect their learning environments. Third, we provide a more global picture of how workplaces and schools contribute to apprentices' vocational development, especially regarding their training satisfaction and commitment. Fourth, we provide methodological advancements over existing studies by (a) using an integrative, person-centred approach to explore patterns of situational resources in workplaces and schools; (b) examining how apprentices' personal resources predict membership in more or less favourable situational resource patterns; (c) testing whether more beneficial resource patterns are related to greater apprenticeship satisfaction and commitment; and (d) investigating a heterogeneous sample of apprentices (N = 1,185), which enables the study of learning conditions in apprenticeships more generally. As such, our study advances an integrative understanding of the variations in resources that characterise apprentices' learning environments and their core attitudes towards their educational pathways.

1.1 Situational Resources

Situational resources are physical, psychological, social, or organisational characteristics of the workplace or school that are located at the level of the task (e.g., task variety), the trainer or teacher (e.g., instruction quality), coworkers or classmates (e.g., classroom climate), and the organisation or institution at large (Bakker et al., 2007; Demerouti et al., 2001). Situational resources are functional in reaching work-related goals; they foster effective learning and educational achievements and help individuals deal with challenges and demands (Bakker & Demerouti, 2007). Regarding learning in apprenticeships, scholars have highlighted that aspects such as high-quality instruction, guidance, and support and the opportunity to work on varied tasks in a self-determined manner play key roles in the development of vocational competencies and the formation of vocational identities (Mikkonen et al., 2017; Nisula & Metso, 2019). Apprentices with higher situational resources not only learn faster and better, they also evaluate their learning environments more positively, maintain interest and motivation, and cope better with challenges and demands that arise at work or school (Powers & Watt, 2021; Reegård, 2015).

Demands refer to quantitative (e.g., high-workload and time-pressure) and qualitative (e.g., high task complexity) aspects of work or school, which require energy and effort to manage. Exceeding demands can be a barrier to learning (Bakker & Demerouti, 2007), for example, when too much time pressure hampers a deeper reflection about solving a task and learning from mistakes or when tasks are too difficult, such as that apprentices might be inclined to give up early. Although there is no doubt about possible negative effects of exceeding demands, researchers also have posited that a certain amount of demands is pivotal for competence development. Demanding tasks motivate individuals to engage in learning

(Taris & Feij, 2004) if they value those tasks as challenging (Elfering et al., 2007; Tims et al., 2016). Reegård (2015) discovered, for example, that sales assistant apprentices found it both difficult and fun to interact with dissatisfied customers and that the challenge of handling demanding or multiple customers at once fostered the apprentices' competence development. In that sense, both quantitative and qualitative demands can function as learning resources (Taris & Feij, 2004; Taylor & Watt-Malcolm, 2007).

Although learning within and across different locations has been acknowledged as essential for competence development in vocational education and training (Aarkrog, 2005; Akkerman & Bakker, 2012), research that jointly analyses resources in the workplace and at vocational schools is still rare. Moreover, studies using large samples of apprentices have been based mostly on variable-centred approaches (e.g., Elfering et al., 2016; Nisula & Metso, 2019; Powers, 2020). These approaches typically describe how process (e.g., core self-evaluations [CSE]) and outcome (e.g., satisfaction) variables are related when the effect of other variables is controlled for. Following Eye and Bogat (2006), we argue that it is necessary to use a person-centred approach and to look at patterns of learning situations within subgroups of an apprentice population.

Such an approach is supported by COR theory, which posits that resources often come "in packs" and are thus intertwined (Hobfoll et al., 2018). It has been proposed, for example, that individuals in jobs with higher learning opportunities might also have more job autonomy, more working time flexibility, and more support for their career development (Bakker et al., 2007). Studies of apprentices have confirmed that resources afforded at the level of the task, the supervisor, and the social group are often closely related. They show, for example, that learners who experience their tasks as meaningful and conducive to learning also perceive their educators as highly competent and supportive (Hofmann et al., 2014; Mikkonen et al., 2017; Stalder & Lüthi, 2018) and that increasing task complexity goes along with increasing decision latitude and responsibility in learners (Reegård, 2015).

Whether the assumption of intertwined resources holds true only within a certain learning location (i.e., the workplace) or across different learning locations (i.e., workplace and school) has rarely been explored with greater samples of learners (see, e.g., Stalder & Schmid, 2016). VET researchers have pointed to the different rationalities and conflicting perspectives of theoretical and practical learning (Ferm, 2021; Schaap et al., 2011) and have highlighted that learners often perceive schools and workplaces as separate environments that have little to do with each other (Akkerman & Bakker, 2012; Reegård, 2015; Rintala et al., 2019). Current studies focused mainly on processes, methods, and means to strengthen links between theoretical knowledge, practical skills, and vocational attitudes (Aarkrog, 2005; Baartman & de Bruijn, 2011; Evans et al., 2011).

In this study, our interest was to explore more closely whether apprentices perceive the two learning environments as aligned or contrasting. In the first case—in line with COR

theory—high (low) resources in the workplace would be coupled with high (low) resources at school, constituting an overall favourable (unfavourable) pattern of situational resources. In the second, more plausible case, resource patterns would be homogenous within one learning location, whereas resources across workplaces and schools would appear to be unrelated. Given the lack of evidence regarding resource patterns in apprenticeships and not knowing how resources and demands in workplaces and schools are interlinked, we chose an explorative approach and asked the following.

Research questions: How many resources' profiles can be found in the data? What are their main characteristics, and how do they differ in terms of workplace and school-related resources?

1.2 Core Self-Evaluations

Personal resources are characteristics of the individual that refer to their personality and ability to control and affect the environment successfully (Hobfoll et al., 2018; Xanthopoulou et al., 2009). Some of the most prominent and intensively studied personal resources are CSE. CSE comprise a latent higher order trait that describes fundamental premises individuals hold about their worthiness, effectiveness, and capabilities as persons (Judge et al., 2003). They are composed of four interrelated dispositional traits: Self-esteem, generalised self-efficacy, internal locus of control, and emotional stability (Judge et al., 2003).

Research has suggested that CSE affect learners' situational resources in several ways. First, CSE influence the way individuals perceive and process information about their environment (Chang et al., 2012). Persons high in CSE tend to pay more attention to positive aspects of their situations, resulting in more favourable evaluations of their workplaces or schools (see, e.g., Judge & Bono, 2001; Wu & Griffin, 2012). Thus, apprentices with high CSE might perceive more or better situational resources in their workplaces and schools than other learners. Second, CSE affect individuals' learning environments directly, because persons with high CSE are self-confident and highly adaptive and trust in their abilities to influence their environments (Hirschi et al., 2015). If their jobs or workplaces do not reflect the environments they seek, they engage actively in behaviours to change their job conditions (Tims & Bakker, 2010) and take actions to make their workplaces more rewarding (Judge & Kammeyer-Mueller, 2011). Following this, apprentices with high CSE might search more proactively for challenging and complex tasks, ask more often for information and advice, or demand more autonomy compared to apprentices with lower CSE. This was supported, for example, in a study that found apprentices with higher CSE had higher autonomy than other learners (Elfering et al., 2016). Other researchers have reported that apprentices who successfully engaged in and completed challenging tasks felt confirmed in their self-efficacy

and became more confident about their work; in turn, they sought actively to engage in even more challenging tasks (Fjellström, 2014; Reegård, 2015).

In sum, higher CSE may thus be linked to more situational resources because apprentices with high CSE have more optimistic views of their workplaces and schools and are more likely to shape and adapt their learning environments proactively according to their needs and interests.

As Hypothesis 1, we propose that CSE are positively related to situational resources, such as that apprentices with higher CSE are more often found in beneficial situational resource patterns than apprentices with lower CSE.

1.3 Satisfaction and Commitment

There is broad evidence that situational resources relate to a wide range of individual, work-related, and educational outcomes, such as job and education satisfaction, performance, engagement, and commitment (Nägele & Stalder, 2019; Pino-James et al., 2019; Truxillo et al., 2012). In the context of apprenticeship programmes, it is of particular importance to know how resources in the two learning locations affect learners' satisfaction with their apprenticeships and their commitments to their learned occupations. Apprenticeship satisfaction can be defined as learners' positive (or negative) evaluative judgement about their apprenticeship situation (Weiss, 2002). Occupational commitment reflects individuals' affective reaction to their occupation (Cohen, 2007) and indicates to what extent someone feels connected to a certain occupational domain (Major et al., 2012). Apprenticeship satisfaction and occupational commitment are both indicators and outcomes of high-quality education and training (Fischer, 2014). They are linked to apprentices' intentions to stay engaged, to complete their apprenticeships, and to remain in their occupational fields after graduation (Forster-Heinzer et al., 2016; Nägele & Neuenschwander, 2014; Stalder & Schmid, 2016).

Several studies have suggested that apprentices with more situational resources are generally more satisfied with their training (Messmann & Mulder, 2015; Taris & Feij, 2004) and more committed to their learned occupations (Haasler, 2007; Nägele & Neuenschwander, 2014). In a study of apprentices in their final years of training, Kälin et al. (2000) found that learners who reported higher job control felt more valued as colleagues and were more satisfied with their apprenticeships than apprentices in less favourable environments. In contrast, a lack of situational resources might be a barrier to competence development and may correspond with negative attitudes towards the apprenticeship. For example, Stalder and Schmid (2016) showed that apprentices in low-quality apprenticeships were less satisfied with their training and less committed to their organisations than apprentices in better learning situations. Although there is broad agreement that workplaces affect apprentices' satisfaction and commitments, it is less clear whether and to what extent resources in

vocational schools matter. Educational researchers have argued that optimal learning environments foster students' positive emotions and engagement and show that a combination of challenging and meaningful classwork, student autonomy, and high teacher support plays an important role in this process (Shernoff, 2013). Studies with apprentices have suggested, however, that resources at vocational schools seem to affect learners' general attitudes towards their apprenticeships to only a small extent (Stalder & Carigiet Reinhard, 2014). This might be due to apprentices' identification with their roles as "young workers in training" rather than as school students (Rintala et al., 2019), resulting in a stronger bonding to the workplace (Reegård, 2015), or more simply to the fact that apprentices spend more time in their workplaces than in their schools.

Despite certain doubts about the influence of school-related resources, based on strong evidence of workplace resources, patterns of situational resources can be assumed to be related to apprentices' satisfaction and commitments. Thus, we expected that learners with overall beneficial resource patterns (especially those with high workplace resources) would evaluate their apprenticeships more positively than those in less favourable patterns.

As Hypothesis 2, we propose that apprentices in beneficial situational resource patterns experience (a) higher apprenticeship satisfaction and (b) higher occupational commitments compared to learners in less favourable patterns.

2 Method

2.1 Data and Sample

We relied on longitudinal data from the Swiss youth panel study "Transition From Education to Employment" (TREE, 2016), which is a social science data infrastructure funded mainly by the Swiss National Science Foundation and located at the University of Berne, Switzerland. The TREE study explores the postcompulsory educational and labour market pathways of more than 6,000 learners, who participated in the "Programme for International Student Assessment" (PISA) study in 2000 and were at the end of compulsory schooling at that time. Data available to date include PISA 2000 and 10 TREE waves carried out between 2001 and 2019.

For this paper, we selected a subsample of 1,185 apprentices who had completed the written survey and were at the end of the second year of their apprenticeships in 2002 or 2003. Wave-specific response rates in 2002 and 2003 were 88% and 87%, respectively. Learners had a mean age of 18.1 years (SD = 0.65), and 43.6% were female. Two-thirds (66.2%) of them had attended a type of lower secondary education with extended academic requirements (basic requirements: 28.8%; schools without tracking: 5.0%). Of this sample, 47.8% were in

apprenticeships with high intellectual demands (e.g., commercial employee, IT technician), whereas 30.7% were in apprenticeships with medium intellectual demands (e.g., electrical fitter, dental assistant) and 21.5% were in apprenticeships with lower intellectual demands (e.g., retail sales assistant, cook, painter; Stalder, 2011). The apprentices lived in the German (64.9%), French (24.0%), and Italian (11.1%) language regions of Switzerland.

2.2 Measures

Means, standard deviations, scale score reliabilities, and bivariate correlations of all variables[1] are reported in Table 1.

2.2.1 Situational Resources

We used five indicators to assess situational resources in workplaces and at schools: Instruction quality, climate, learning opportunities, autonomy, and demands.

Trainers and teachers' instruction quality was assessed using five items each. Participants indicated their impressions of their vocational trainers and class teachers on a 4-point scale (1 = *not at all true* to 4 = *exactly true*). Examples of items included, "If I ask a question, my vocational trainer has time to explain it" and "Usually, my teacher tells me whether I solved a task well" (TREE, 2016).

Organisational climate was assessed with three items (e.g., "My company is a place where I like to be") and climate at school was assessed with two items (e.g., "I appreciate how we treat each other in class") on a 4-point scale (1 = *not at all true* to 4 = *exactly true*; TREE, 2016).

Learning opportunities were measured with three items each (e.g., "In the workplace/at school, I can always learn something new" and "I can fully apply my knowledge and skills"; (Prümper et al., 1995; TREE, 2016) on a 5-point scale (1 = *hardly ever* to 5 = *very often*).

Autonomy in the workplace and at school was assessed with three items, each from the Short Questionnaire for Job Analysis (e.g., "I take part in the decision-making about which tasks I have to do" and "Overall, I am free to decide in which order I organise the various steps of my work"; Prümper et al., 1995) along a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*).

Demands were assessed with five items, each taken from Prümper et al. (1995), focusing on qualitative demands related to the difficulty and complexity of tasks (e.g., "I must do tasks that are too complicated for me") and quantitative demands related to time pressure and workload (e.g., "I have too much to do") along a 5-point scale (1 = *all the time* to 5 = *never*). For demands in the workplace, two separate scales could be built to distinguish between qualitative (three items) and quantitative (two items) demands. School demands were summarised in a single indicator.

[1] Additional information on indicators and items can be requested from the corresponding author.

2.2.2 Core Self-Evaluations

The TREE (2016) study assessed self-efficacy, self-esteem, and affectivity. These indicators were used to form the higher-order construct CSE (Keller & Semmer, 2013). The fourth element, locus of control, was not assessed. Because locus of control generally tends to show weaker convergent and discriminant validity compared with the other three traits, its inclusion in CSE is controversial (Judge et al., 2003; Keller & Semmer, 2013).

General self-efficacy was assessed with four items from the Schwarzer and Jerusalem (2002) German General Self-efficacy questionnaire. The items were rated on a 4-point scale (1 = *strongly disagree* to 4 = *strongly agree*; e.g., "I can always manage to solve difficult problems if I try hard enough").

Self-esteem was measured with eight items from the Rosenberg Self-esteem Scale (Rosenberg, 1979) on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*; e.g., "I feel that I am a person of worth").

Affectivity was assessed using 10 items from the Positive and Negative Affect Schedule (Krohne et al., 1996). Items were scored on a 5-point scale ranging from 1 (*very little/not at all*) to 5 (*very much*; e.g., "Over the last month, did you feel annoyed?"). Values inverted from negative to positive. Affectivity is typically assumed to be a proxy for neuroticism, and the two constructs are often used interchangeably (Judge et al., 2003).

2.2.3 Satisfaction and Commitment

Apprenticeship satisfaction was assessed with three items adapted from Bruggemann et al. (1975). Items were rated on a 7-point scale (1 = *very unsatisfied* to 7 = *very satisfied*) in response to questions such as "In general, how satisfied are you with your apprenticeship?"

Occupational commitment included three items, measured on a 4-point scale (1 = *not at all true* to 4 = *exactly true*) (TREE, 2016). Participants indicated what they thought about their occupations (e.g., "I am proud of the occupation, I'm trained in" and "I really like the work that my occupation contains").

2.3 Analytical Procedure

All of the analyses were run with Mplus 8.3. Before addressing the research questions and hypotheses, a confirmatory factor analysis (CFA) was run to evaluate the empirical distinctness of the study variables and to test whether the theoretical measurement model fit the actual data. We applied the maximum likelihood estimator with robust standard errors for our analyses. Model fit was assessed using the comparative fit index (CFI), the Tucker–Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardised root

mean square residual (SRMR). Values above .90 and .95 for the CFI and TLI, respectively, indicated adequate or excellent model fit, whereas values below .08 or .06 for the RMSEA and SRMR support acceptable or excellent model fit, respectively (Hu & Bentler, 1999).

The situational resource measures first were examined separately for both learning locations. Regarding workplace resources, we tested a five-factor model, including demands as a single scale, and a six-factor model distinguishing between qualitative and quantitative demands. Both models showed acceptable fit (five-factor model: $\chi 2 = 669.45$, $df = 125$, $p < .001$, CFI = .91, TLI = .89, RMSEA = .06, SRMR = .03; six-factor model: $\chi 2 = 497.49$, $df = 120$, $p < .001$, CFI = .94, TLI = .92, RMSEA = .05, SRMR = .04). We decided to keep the six-factor model to analyse possible effects of the two kinds of demands. We ran a five-factor model for school resources, which showed good fit ($\chi 2 = 370.57$, $df = 109$, $p < .001$, CFI = .95, TLI = .94, RMSEA = .05, SRMR = .03). Both the six-factor model for the workplace and the five-factor model for school fit the data significantly better than a one-factor model or different two- to four-factor models did. Finally, we ran an 11-factor model with all study variables and obtained acceptable fit ($\chi 2 = 1{,}350.27$, $df = 505$, $p < .001$, CFI = .93, TLI = .92, RMSEA = .04, SRMR = .04).

Table 1: Means, Standard Deviations, Scale Score Reliabilities, and Bivariate Correlations of all Study Variables

Study variables		M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Situational resources																	
1	Trainer instruction quality	3.99	.85	*.88*													
2	Organisational climate	4.13	.75	.53***	*.74*												
3	Learning opportunities at work	4.05	.68	.41***	.45***	*.76*											
4	Autonomy in the workplace	3.36	.84	.34***	.39***	.41**	*.70*										
5	Qualitative workplace demands	2.07	.61	-.20***	-.23***	-.07*	-.06*	*.58*									
6	Quantitative workplace demands	3.12	.87	-.09*	-.12***	.11***	-.03	*.27*	*.56*								
7	Teacher instruction quality	3.55	.88	.05	.09*	.18***	-.02	-.01	.06	*.87*							
8	School climate	4.07	.90	.06*	.17***	.11***	.04	-.05	-.03	.22***	*.79*						
9	Learning opportunities at school	3.53	.69	.06*	.12***	.24***	.05	-.03	.01	.49***	.22***	*.70*					
10	Autonomy at school	2.58	.89	.02	.00	.05	.04	.09***	.02	.18***	.10***	.14***	*.72*				
11	School demands	2.28	.76	-.07*	-.12***	-.18***	-.03	.27***	.03	-.22***	-.19***	-.11***	.00	*.81*			
Personal resources																	
12	Core self-evaluations	3.60	.47	.26***	.31***	.36***	.21***	-.30***	.00	.16***	.23***	.21***	-.01	-.36***	*.75*		
Positive attitudes towards the apprenticeship																	
13	Apprenticeship satisfaction	4.54	1.09	.46***	.53***	.53***	.33***	-.19***	.00	.16***	.15***	.25***	.04	-.19***	.34**	*.65*	
14	Occupational commitment	3.27	.57	.32***	.45***	.44***	.25***	-.15***	-.02	.14***	.07*	.17***	.00	-.15***	.25***	.52***	*.77*

Note. N = 1,185 apprentices in their second year of IVET. Items for the instruction quality and organisational climate scales were recoded to a 5-point scale to fit the scale range of the other situational resources. Scale score reliabilities are in the diagonal.

*$p < .05$

***$p < .001$

To examine the latent subgroups of homogenous profiles of apprentices' situational resources, we performed latent profile analysis (LPA) using the scale means of the 11 resources from the retained CFA measurement model. We compared model solutions with two to six profiles using maximum likelihood estimation. To choose the best-fitting model (Table 3), we considered the Bayesian information criterion (BIC); the sample-adjusted Bayesian information criterion (SABIC); the adjusted version of the Lo, Mendell, and Rubin likelihood-ratio test (LMRT); and the parametric bootstrapped likelihood ratio test (BLRT). A good-fitting model is usually indicated by lower BIC and SABIC values as compared to other model solutions, and the LMRT and BLRT statistics should be significant at $p < .05$ (Geiser, 2011).

To test Hypothesis 1, we started from the final LPA solution retained, and we explored the relationship between CSE and the probability of membership in the profiles. CSE was included in the final model as an auxiliary variable, and a multinomial logistic regression was run using the R3STEP command in Mplus 8.3. R3STEP shows whether an increase in an antecedent makes an individual more or less likely to belong to one profile over another. In that sense, CSE was treated as a latent profile predictor, regressed on each profile and compared to one profile that was used as reference group (Vermunt, 2010).

To test Hypothesis 2, we modelled apprenticeship satisfaction and occupational commitment as auxiliary variables added to the final profile solution using the BCH command in Mplus 8.3. The BCH procedure allowed us to test for mean level differences across the resource profiles.

3 Results

3.1 Situational Resource Profiles

The primary aim of the study was to examine whether distinctive patterns of situational resources exist in apprentices' workplaces and vocational schools (research questions). The LPA suggested dividing group situational resources into three or four profiles. We opted for the four-profile solution, given the fit criteria described above, theoretical aspects, the interpretability of the profiles, and the class sizes. It had a comparatively low SABIC (28,451.39) and showed the least significant LMRT value (225.71, $p < .05$) before LMRT values became nonsignificant (Table 2). Table 3 reports the means and standard errors of the 11 indicators in the four profiles. Figure 1 depicts the means of the four profiles.

Table 2: Fit Indices for the LPA Models

Number of profiles	BIC	SABIC	LMRT p-value	BLRT p-value
2	29096.87	28988.87	.01	.00
3	28779.05	28632.94	.02	.00
4	28635.62	28451.39	.03	.00
5	28583.26	28360.91	.17	.00
6	28145.83	28301.72	.38	.00

Table 3: Means of the Resource Variables Across Latent Profiles

	High resources (A) N = 522, 44.1%		Average resources (B) N = 448, 37.8%		High work–low school resources (C), N = 158, 13.3%		Low work–average school resources (D), N = 57, 4.8%	
	M	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*
Trainer instruction quality	4.42	.06	3.59	.11	4.35	.10	2.22	.17
Organisational climate	4.56	.05	3.71	.08	4.42	.14	2.52	.24
Learning opportunities at work	4.44	.03	3.74	.07	4.09	.15	2.93	.18
Autonomy in the workplace	3.64	.05	3.10	.06	3.65	.15	1.93	.20
Qualitative workplace demands	1.96	.04	2.23	.05	1.89	.10	2.44	.15
Quantitative workplace demands	3.15	.05	3.15	.06	2.95	.09	3.44	.18
Teacher instruction quality	4.03	.05	3.38	.11	2.60	.15	3.80	.19
School climate	4.37	.04	3.96	.09	3.56	.16	3.95	.18
Learning opportunities at school	3.89	.04	3.38	.08	2.91	.09	3.52	.13
Autonomy at school	2.72	.05	2.61	.06	2.19	.09	2.50	.13
School demands	2.07	.04	2.46	.07	2.40	.14	2.41	.12
Trainer instruction quality	4.42	.06	3.59	.11	4.35	.10	2.22	.17

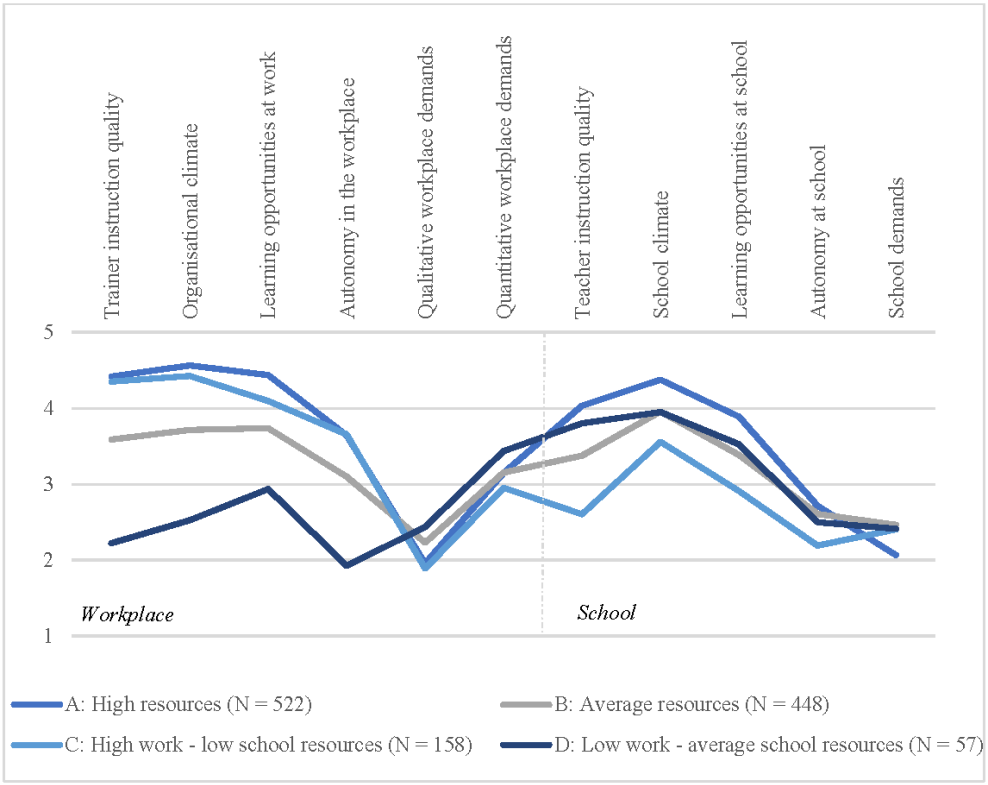


Figure 1: Four-Profile Model: Means of Apprentices' Situational Resources at Both Learning Locations

The four profiles differ with respect to the general level of resources (high–low) and to specific resource levels in the workplace and at school (e.g., low resources in the workplace and high resources at school). Overall, resources vary greatly between profiles regarding the workplace, including large differences in work-related instructional quality, climate, and learning opportunities, but less so for school (Figure 1). Workplace demands showed few variations and were low to moderate in all profiles, as did autonomy at school, which was low in all four profiles.

The profiles reveal that some apprentices estimated the resources at both locations to be similarly high (Profiles A and B), whereas others found a stark contrast between situational resources provided in the workplace versus at school (Profiles C and D).

Profile A (high resources), with 522 apprentices (44.1% of the sample), is characterised by favourable situational resources at both learning locations; that is, the instruction quality provided by trainers and teachers at work and vocational school is high, many learning opportunities are available, the organisational and school climate is conducive to learning, and apprentices enjoy high autonomy in the workplace. Overall, apprentices in this profile

indicated that they appreciated being in the workplace and school and that interactions with VET educators and colleagues ran smoothly.

Profile B (average resources), including 448 apprentices (37.8%), is characterised by instruction quality slightly above mid-level at both learning locations and moderate autonomy in the workplace.

Profiles C (high work–low school resources) and D (low work–average school resources) cover smaller groups of apprentices, with 158 (13.3%) and 57 (4.8%) learners, respectively. In Profile C, high resources are available in the workplace (similar to Profile A), whereas resources at school seem to be limited. The instruction quality at school is much lower as compared to the other profiles, and the school climate and learning and decision-making opportunities are at lower levels than the other profiles are.

In contrast, apprentices with Profile D report very low resources in the workplace, while resources at school are average and comparable to those of Profile B. In the workplace, apprentices with Profile D seem to be very poorly instructed and guided and have limited opportunities for learning and very low autonomy.

Additional analyses were run to test whether profile membership was related to apprentices' gender, lower secondary education, the intellectual demand of the apprenticeships, and the language region. Significant differences were found for gender, with women being slightly overrepresented in Profiles C (52.5%) and D (59.6%) and underrepresented in Profiles A (36.8%) and B (46.4%), suggesting that women perceive the resources afforded by workplaces and schools as aligned less often than men do. Profiles A and C differed to some extent in terms of the intellectual demands of the apprenticeships. In Profile A, we found more learners in apprenticeships with low and medium intellectual demands (61.4%) than expected (52.2%), and Profile C had more learners in apprenticeships with high intellectual demands (69.0%; expected 47.8%). The profiles did not differ by apprentices' lower secondary education or language region.

3.2 CSE and Situational Resource Profiles

Hypothesis 1 stated that apprentices with higher levels of CSE would more often be in a resource profile characterised by favourable situational resources than apprentices with lower levels of CSE would. To test this hypothesis, we regressed CSE on Profiles A, C, and D and used Profile B as a reference. The results confirm our hypothesis (Table 4).

Table 4: Relationships Between CSE and Latent Profile Membership

	Profile A vs B.			Profile C vs B.			Profile D vs B.		
	Coefficient	*SE*	*OR*	Coefficient	*SE*	*OR*	Coefficient	*SE*	*OR*
CSE	2.62***	.29	24.20	.90*	.43	5.78	-.76*	.34	.91

Note. Multinomial logistic regression. Coefficients correspond to logit values. OR values above 1 (below 1) indicate a higher (lower) relative chance to be in Profile A, C, or D than in Profile B (reference group). * $p < .05$, *** $p < .001$

In line with what we expected, apprentices with higher CSE were much more likely found in Profile A (high resources; $OR = 24.2$; $p < .001$), somewhat more likely found in Profile C (high work–low school resources; $OR = 5.78$; $p < .001$), and less likely found in Profile D (low work–high school resources) than in Profile B (average resources).

3.3 Resource Profiles, Satisfaction, and Commitment

Apprenticeship satisfaction and occupational commitment were modelled as auxiliary variables with the LPA to test differences between profile memberships (Table 5). Most of the comparisons were statistically significant, supporting Hypothesis 2.

Table 5: Comparison of Outcomes Across Latent Profiles

	Profile means					Profile comparison					
	A	B	C	D	Overall effect	A vs B	A vs C	A vs D	B vs C	B vs D	C vs D
Satisfaction	$5.10_{B, C, D}$	$4.08_{A, C, D}$	$4.58_{A, B, D}$	$2.97_{B, C, A}$	260.93*	236.08***	30.70***	204.50***	27.41***	54.63***	97.73***
Commitment	$3.50_{B, C, D}$	$3.04_{A, C, D}$	$3.37_{A, B, D}$	$2.72_{B, C, A}$	111.78*	140.24***	6.69*	62.35***	37.51***	10.28***	38.60***

Note. The indicated values are scale means. The overall significance is a chi-square value with $df = 3$. Subscripts designate profiles that differ significantly at $p < .05$.

Levels of apprenticeship satisfaction and occupational commitment differed in a similar manner across profiles, being highest among learners in Profile A and rather high in Profile C, followed by the profile with average resources (Profile B), and was the lowest among individuals in the profile with low work and average school resources (Profile D).

4 Discussion

4.1 General Discussion

Based on a person-centred approach, we investigated apprentices' situational resources in the workplace and at vocational schools and explored how resource profiles are related to CSE, apprenticeship satisfaction, and occupational commitment. Supporting previous research

(Stalder & Schmid, 2016), our results show that distinct profiles of work- and school-related resources could be identified among our large and heterogeneous sample of apprentices. We found four profiles, characterised by different levels and combinations of work- and school-related resources, which varied strongly regarding the workplace and, to some extent, regarding vocational school.

We assumed that situational resources are intertwined (Hobfoll et al., 2018) and proposed two types of profiles. In the first profile, resources are interrelated across the learning locations (i.e., similar levels of resources in both locations). The second describes a profile whereby workplace and school resources are perceived as contrasting each other (i.e., dissimilar or unrelated resources). Our results show that both types occurred. In Profiles A and B, which included more than 80% of the learners, work- and school-related resources appeared to be aligned. In contrast to concerns raised in previous studies (Ferm, 2021; Schaap et al., 2011), our results thus suggest that the large majority of the apprentices perceived their workplace and school as equally conducive to learning—at both the level of the tasks that provide opportunities for learning and the social level, including supportive educators and colleagues and a favourable learning climate. This relatively high alignment might be explained by the close matching of workplace and school curricula in Swiss apprenticeships (Stalder & Lüthi, 2018), apprentices' acknowledgement of the value and importance of both theoretical and practical knowledge, and educators who help learners to identify bridges between learning environments (Baartman & de Bruijn, 2011; Evans et al., 2011).

The more misaligned profiles, C and D, include smaller proportions of apprentices, with less favourable learning situations in vocational schools (C) or workplaces (D). Our findings may be explained by fit-theoretical approaches, which posit that newcomers must establish not only a fit to the occupation at a general level but also domain-specific fits to the organisation, the work tasks, and the supervisor (Jansen & Kristof-Brown, 2006). While learners in Profiles A and B might have found an adequate fit to both the workplace and school, apprentices in Profile C seem to fit well to the learning situation in the workplace but fit less well to that at school. This might concern a group of apprentices who are highly engaged in practice-based learning but have limited motivation to learn at school (Mulder et al., 2015). In Profile D, the learners' interests and needs appear not to correspond to the company's learning conditions. This group of learners seem to be poorly integrated and might have to do tasks that lack challenge and meaning (Nägele & Stalder, 2019).

Following the theoretical considerations of resource theories (Bakker & Demerouti, 2007; Taris & Feij, 2004), we argued that demands might function in two ways: As a barrier to or a source for learning. In the first case, learners would report low levels of learning opportunities because they are overchallenged by overly complex tasks and too much time pressure, or be underchallenged because their tasks are too easy, repetitive, or not meaningful (Fuller & Unwin, 2004). In the second case, apprentices would experience high levels of both

learning opportunities and demands, in the sense that the demands challenge them to gain new knowledge and skills (Messmann & Mulder, 2015; Reegård, 2015). Our findings do not show a clear picture. Although, in Profiles C and D, having limited learning opportunities in either schools or workplaces seems to go along with low demands, demands varied only slightly between the profiles. Demands were low to moderate in all profiles, which suggests that, in general, apprentices did not seem to be overchallenged when they were surveyed. At the time of the survey, apprentices were at the end of the second year of their apprenticeship. By then, adjustment processes were well advanced (Nägele & Neuenschwander, 2014), and most learners seemed to cope adequately with the requirements of their schools and companies. Such an interpretation is supported by the fact that we did not find a profile with low resources both in the workplace and at school. Because early leaving happens most often in the first year of apprenticeships (Bundesamt für Statistik, 2019), we might have missed the learners who started in a generally poor-fitting apprenticeship.

We were interested in determining whether school resources would matter for the profile analysis. Our results show that they contributed to the building of the profiles, but to a lesser extent than workplace resources did. This might be due to the school curricula and tight lesson plans, which regulate teacher instruction and learning processes highly. In the workplace, learning is embedded in daily work processes. It is more informal and less structured regarding the content and timing of the learning process (Nägele & Stalder, 2019). Another explanation could be more straightforward: In Switzerland, apprentices spend more time in the workplace (3–4 days a week) than at school (1–2 days), and the organisational conditions shape their vocational identity and their commitment to the occupation (Haasler, 2007; Klotz et al., 2014; Nägele & Neuenschwander, 2014). Thus, apprentices' appraisals of the workplace could be more pronounced and differentiated than their evaluations of the learning conditions at school, which would result in greater variation in the workplace resources.

Our results reveal that the relative chance of profile membership differed as a function of apprentices' personal resources, with higher CSE being related to more favourable resource profiles. In line with previous research, apprentices with high CSE might evaluate their situational resources more positively (Judge & Bono, 2001; Wu & Griffin, 2012), and they might be more confident asking for information, feedback, or more autonomy to achieve even better learning conditions (Judge & Kammeyer-Mueller, 2011; Mikkonen et al., 2017). Such learners shape their learning environments to improve their learning situation and make it more rewarding (Hirschi et al., 2015; Judge & Kammeyer-Mueller, 2011; Powers & Watt, 2021). Our finding that high levels of CSE are related to better resource profiles is also in line with COR theory (Hobfoll et al., 2018), which stipulates that having resources facilitates the further accumulation of resources. While we proposed that higher CSE leads to better situational resources, a reversed effect could also be plausible. Scholars have suggested reciprocal effects of personal and situational resources, such that individuals with higher

personal resources can secure more job or educational resources, which, in turn, would boost individuals' personal resources (Fuller & Unwin, 2004; Shernoff, 2013; Xanthopoulou et al., 2009). Because our analytical model did not test for a reversed effect, we cannot exclude the possibility of a bidirectional relationship between CSE and situational resource profiles.

Finally, our results revealed that the latent profiles were associated with apprenticeship satisfaction and occupational commitment. In line with previous research, apprentices with high resources at both learning locations were the most satisfied and committed (Stalder & Schmid, 2016). Interestingly, the apprentices in Profiles A and C—both with high resources in the workplace—evaluated their apprenticeships better than apprentices in the other profiles did. Workplace resources play a key role in educational success during apprenticeships and seem to affect subjective evaluations more than school-based resources do (Hofmann et al., 2014; Stalder & Carigiet Reinhard, 2014).

4.2 Practical Implications

Our results show, first, that resources come in packs (Hobfoll et al., 2018) and are intertwined within and—for most apprentices—between learning locations. While the latter might be particular to Swiss apprenticeships, our findings support recommendations from previous research asking for closer matching between workplace and school curricula (Aarkrog, 2005) or stronger guidance for students in seeing the value of and bridges between different kinds of learning in different learning contexts (Evans et al., 2011).

Second, our findings confirm that high resources in both the workplace and school are crucial for apprenticeship satisfaction and occupational commitment (Nägele & Stalder, 2019; Truxillo et al., 2012). To foster positive attitudes among apprentices towards their chosen pathway, it is important to take a global view on apprentices' learning and how learning contexts should be created. Understanding the interplay and connectedness of situational resources—specifically, their patterns—may help teachers, trainers, and policy makers to ensure high-quality programmes that provide learning-relevant resources at different levels. Beneficial resource patterns include the possibility to work on a variety of meaningful tasks throughout the apprenticeship; increasing opportunities to decide on what, when, and how certain tasks should be done; and targeted guidance and support. In addition, it is important to address the learning climate within the organisations, which should value learning and career development among all their staff, and to ensure that schools have the means and expertise to support students with different learning needs.

Considering apprentices who perceive their learning environments as detached from each other or who find themselves in less favourable resource patterns, teachers and trainers must be aware that this misalignment might be inconspicuous or invisible in the other learning

location (Stalder & Schmid, 2016). Thus, in such cases, it is important to strengthen the cooperation between workplaces and schools and to give apprentices the support they need.

Finally, our results emphasise the importance of fostering apprentices' personal resources. Apprentices' ability, motivation, and engagement have long been seen as prerequisites to learning (Billett, 2008; Mikkonen et al., 2017). Our results further show that apprentices can and do use their own resources to shape their learning environment. Thus, teachers and trainers can facilitate competence development and knowledge transfer from one learning environment to the other, not only directly by establishing favourable learning situations but also indirectly by empowering apprentices to change their environment proactively.

4.3 Limitations and Further Research

Although the current study presents several advantages over previous research, it also faces some limitations. First, we relied on a sample of apprentices in Switzerland. Our findings should be transferred to other countries and other types of apprenticeships with caution (Markowitsch & Wittig, 2020). Second, we relied on self-report measures. Shared method bias might have affected the observed relationships between the applied measures. Future studies may include ratings from VET trainers and teachers to enrich the results and avoid potential bias. Third, as with all cross-sectional studies, it is not possible to reach clear conclusions regarding the directionality of the associations among resource profiles, CSE, and the attitudes towards apprenticeship.

The current study could not examine whether resource profiles and the chance to be in a more beneficial resource profile are more likely in certain occupational domains or if they were related to structural conditions of the apprenticeship programmes or to specific learner characteristics. Further research might explore the extent to which resource patterns vary among occupations and industries, the apprentices' age groups and educational experiences, different types and sizes of enterprises, and national VET systems (Mulder et al., 2015). Moreover, longitudinal research is needed to explore how resource patterns change over the time. Such studies are necessary to show how learners gain and maintain resources, and how they protect themselves against resource losses (Hobfoll et al., 2018). Changes to membership in profiles of work- and school-related resources during apprenticeships and after transition into employment could be explored to gain deeper insight into not only the frequency of changes but also the antecedents and outcomes of changing profile membership, in terms of satisfaction, commitment, and successful career development.

5 Conclusion

This study contributed to the emerging research on learning in different IVET environments, finding distinctive situational resource profiles across and within the workplace and school and introducing the higher-order personality concept of CSE. We showed that learners in certain resource situations differ regarding their personal resources, apprenticeship satisfaction, and occupational commitment. Our research is the first to investigate situational resources using LPA, the most rigorous quantitative manner with which to explore interrelations and combinations of resources (Geiser, 2011). Our study is also one of the few studies that looks jointly at resources provided in the workplace and at school, thus taking into account that learning and competence development are important across and beyond the boundaries of specific learning environments (Akkerman & Bakker, 2012; Mulder et al., 2015). Our results indicate that apprentices can use their personal resources to craft their learning environments. Thus, the study corroborates that both learners and educators from different settings and institutions contribute to favourable learning environments together (Billett, 2008) and thus are mutually responsible for the development of occupational skills and a meaningful career.

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References

Aarkrog, V. (2005). Learning in the workplace and the significance of school-based education: A study of learning in a Danish vocational education and training programme. *International Journal of Lifelong Education*, *24*(2), 137–147. https://doi.org/10.1080/02601370500056268

Akkerman, S. F., & Bakker, A. (2012). Crossing boundaries between school and work during apprenticeships. *Vocations and Learning*, *5*(2), 153–173. https://doi.org/10.1007/s12186-011-9073-6

Baartman, L. K. J., & de Bruijn, E. (2011). Integrating knowledge, skills and attitudes: Conceptualising learning processes towards vocational competence. *Educational Research Review*, *6*(2), 125–134. https://doi.org/10.1016/j.edurev.2011.03.001

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, *22*(3), 309–328. https://doi.org/10.1108/02683940710733115

Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. *Journal of Educational Psychology*, *99*(2), 274–284. https://doi.org/10.1037/0022-0663.99.2.274

Billett, S. (2008). Learning through work: Exploring instances of relational interdependencies. *International Journal of Educational Research*, *47*(4), 232–240. https://doi.org/10.1016/j.ijer.2008.07.006

Bruggemann, A., Groskurth, P., & Ulich, E. (1975). *Arbeitszufriedenheit*. Hans Huber.

Bundesamt für Statistik, B. (2019). *Lehrvertragsauflösung, Wiedereinstieg, Zertifikationsstatus. Resultate zur dualen beruflichen Grundbildung* (EBA und EFZ), Ausgabe 2019. BFS.

Chan, S. (2013). Learning through apprenticeship: Belonging to a workplace, becoming and being. *Vocations and Learning*, *6*(3), 367–383. https://doi.org/10.1007/s12186-013-9100-x

Chang, C.-H. D., Ferris, D. L., Johnson, R. E., Rosen, C. C., & Tan, J. A. (2012). Core self-evaluations: A review and evaluation of the literature. *Journal of Management*, *38*(1), 81–128. https://doi.org/10.1177/0149206311419661

Cohen, A. (2007). *Dynamics between occupational and organizational commitment in the context of flexible labor markets: A review of the literature and suggestions for a future research agenda*. Universität Bremen, Institut Technik und Bildung.

Corney, T., & du Plessis, K. (2010). Apprentices' mentoring relationships. The role of 'significant others' and supportive relationships across the work–life domains. *Youth Studies Australia*, *29*(3), 18–26.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands–resources model of burnout. *Journal of Applied Psychology*, *86*(3), 499–512. https://doi.org/10.1037/0021-9010.86.3.499

Elfering, A., Keller, A. C., Berset, M., Meier, L. L., Grebner, S., Kälin, W., Monnerat, F., Tschan, F., & Semmer, N. K. (2016). Taking the chance: Core self-evaluations predict relative gain in job resources following turnover. *Springerplus*, *5*(1702), 1–10. https://doi.org/10.1186/s40064-016-3365-0

Elfering, A., Semmer, N. K., Tschan, F., Kälin, W., & Bucher, A. (2007). First years in job: A three-wave analysis of work experience. *Journal of Vocational Behavior*, *70*(1), 97–115. https://doi.org/10.1016/j.jvb.2006.07.001

European Union. (2016). *The Riga Conclusions. European cooperation in vocational education and training*. https://doi.org/10.2767/437732

Evans, K., Guile, D., & Harris, J. (2011). Rethinking work-based learning: For education professionals and professionals who educate. In M. Malloch, L. Cairns, K. Evans & B. N. O'Connor (Eds.), *The SAGE Handbook of Workplace Learning* (pp. 149–162). SAGE Publications Ltd. https://doi.org/10.4135/9781446200940.n11

Eye, A. v., & Bogat, G. A. (2006). Person-oriented and variable-oriented research: Concepts, results, and development. *Merrill-Palmer Quarterly*, *52*(3), 390–420. https://doi.org/10.1353/mpq.2006.0032

Ferm, L. (2021). Vocational students' ways of handling the academic/vocational divide. *International Journal for Research in Vocational Education and Training*, *8*(1), 1–20. https://doi.org/10.13152/ijrvet.8.1.1

Filliettaz, L. (2011). Collective guidance at work: A resource for apprentices? *Journal of Vocational Education & Training*, *63*(3), 485–504. https://doi.org/10.1080/13636820.2011.580359

Fischer, M. (2014). *Qualität in der Berufsausbildung. Anspruch und Wirklichkeit*. Bertelsmann.

Fjellström, M. (2014). Vocational education in practice: A study of work-based learning in a construction programme at a Swedish upper secondary school. *Empirical Research in Vocational Education and Training*, *6*(2). https://doi.org/10.1186/1877-6345-6-2

Forster-Heinzer, S., Holtsch, D., Rohr-Mentele, S., & Eberle, F. (2016). Do they intend to stay? An empirical study of commercial apprentices' motivation, satisfaction and intention to remain within

the learned occupation. *Empirical Research in Vocational Education and Training*, *8*(1). https://doi.org/10.1186/s40461-016-0041-0

Fuller, A., & Unwin, L. (2004). Expansive learning environments: Integrating personal and organisational development. In H. Rainbird, A. Fuller & A. Munro (Eds.), *Workplace learning in context* (pp. 126–144). https://doi.org/10.4324/9780203571644

Fuller, A., & Unwin, L. (2011). Apprenticeship as an evolving model of learning. *Journal of Vocational Education & Training*, *63*(3), 261–266. https://doi.org/10.1080/13636820.2011.602220

Geiser, C. (2011). *Datenanalyse mit Mplus. Eine anwendungsorientierte Einführung* (2nd Ed.). VS. https://doi.org/10.1007/978-3-531-93192-0

Gessler, M. (2017). The lack of collaboration between companies and schools in the German dual apprenticeship aystem: Historical background and recent data. *International Journal for Research in Vocational Education and Training*, *4*(2), 164–195. https://doi.org/10.13152/IJRVET.4.2.4

Haasler, B. (2007). Apprentices' experiences of occupational and organisational commitment: An empirical investigation in a German automobile company. In A. Brown, S. Kirpal & F. Rauner (Eds.), *Identities at Work* (pp. 261–284). Springer. https://doi.org/10.1007/978-1-4020-4989-7_10

Hirschi, A., Herrmann, A., & Keller, A. C. (2015). Career adaptivity, adaptability, and adapting: A conceptual and empirical investigation. *Journal of Vocational Behavior*, *87*, 1–10. https://doi.org/10.1016/j.jvb.2014.11.008

Hobfoll, S. E., Halbesleben, J., Neveu, J.-P., & Westman, M. (2018). Conservation of resources in the organizational context: The reality of resources and their consequences. *Annual Review of Organizational Psychology and Organizational Behavior*, *5*(1), 103–128. https://doi.org/10.1146/annurev-orgpsych-032117-104640

Hofmann, C., Stalder, B. E., Tschan, F., & Häfeli, K. (2014). Support from teachers and trainers in vocational education and training: The pathways to career aspirations and further career development. *International Journal for Research in Vocational Education and Training*, *1*(1), 1–20. https://doi.org/10.13152/IJRVET.1.1.5

Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jansen, K. J., & Kristof-Brown, A. L. (2006). Toward a multidimensional theory of person-environment fit. *Journal of Managerial Issues*, *18*(2), 193–212.

Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits—self-esteem, generalized self-efficacy, locus of control, and emotional stability—with job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology*, *86*(1), 80–92. https://doi.org/10.1037/0021-9010.86.1.80

Judge, T. A., Bono, J. E., & Thoresen, C. J. (2003). The core self-evaluation scale: Development of a measure. *Personnel Psychology*, *56*(2), 303–331. https://doi.org/10.1111/j.1744-6570.2003.tb00152.x

Judge, T. A., & Kammeyer-Mueller, J. D. (2011). Implications of core self-evaluations for a changing organizational context. *Human Resource Management Review*, *21*(4), 331–341. https://doi.org/10.1016/j.hrmr.2010.10.003

Kälin, W., Semmer, N. K., Elfering, A., Tschan, F., Dauwalder, J.-P., Heunert, S., & Crettaz von Roten, F. (2000). Work characteristics and well-being of Swiss apprentices entering the labor market. *Swiss Journal of Psychology*, *59*(4), 272–290. https://doi.org/10.1024//1421-0185.59.4.272

Keller, A. C., & Semmer, N. K. (2013). Changes in situational and dispositional factors as predictors of job satisfaction. *Journal of Vocational Behavior*, *83*(1), 88–98. https://doi.org/10.1016/j.jvb.2013.03.004

Klotz, V. K., Billett, S., & Winther, E. (2014). Promoting workforce excellence: Formation and relevance of vocational identity for vocational educational training. *Empirical Research in Vocational Education and Training*, *6*(6). https://doi.org/10.1186/s40461-014-0006-0

Krohne, H. W., Egloff, B., Kohlmann, C.-W., & Tausch, A. (1996). Untersuchungen mit einer deutschen Version der "Positive and Negative Affect Schedule" (PANAS). *Diagnostica*, *42*(2), 139–156. https://doi.org/10.1037/t49650-000

Major, D. A., Morganson, V. J., & Bolen, H. M. (2012). Predictors of cccupational and organizational commitment in information technology: Exploring gender differences and similarities. *Journal of Business and Psychology*, *28*(3), 301–314. https://doi.org/10.1007/s10869-012-9282-5

Markowitsch, J., & Wittig, W. (2020). Understanding differences between apprenticeship programmes in Europe: Towards a new conceptual framework for the changing notion of apprenticeship. *Journal of Vocational Education & Training*, 1–22. https://doi.org/10.1080/13636820.2020.1796766

Messmann, G., & Mulder, R. H. (2015). Conditions for apprentices' learning activities at work. *Journal of Vocational Education & Training*, *67*(4), 578–596. https://doi.org/10.1080/13636820.2015.1094745

Mikkonen, S., Pylväs, L., Rintala, H., Nokelainen, P., & Postareff, L. (2017). Guiding workplace learning in vocational education and training: A literature review. *Empirical Research in Vocational Education and Training*, *9*(1). https://doi.org/10.1186/s40461-017-0053-4

Mulder, M. (2019). Foundations of competence-based vocational education and training. In S. McGrath, M. Mulder, J. Papier & R. Suart (Eds.), *Handbook of Vocational Education and Training* (pp. 1–26). Springer. https://doi.org/10.1007/978-3-319-49789-1_65-2

Mulder, R. H., Messmann, G., & König, C. (2015). Vocational education and training: Researching the relationship between school and work. *European Journal of Education*, *50*(4), 497–512. https://doi.org/10.1111/ejed.12147

Nägele, C., & Neuenschwander, M. P. (2014). Adjustment processes and fit perceptions as predictors of organizational commitment and occupational commitment of young workers. *Journal of Vocational Behavior*, *85*(3), 385–393. https://doi.org/10.1016/j.jvb.2014.08.011

Nägele, C., & Stalder, B. E. (2019). Motivation and engagement of learners in organizations. In S. McGrath, M. Mulder, J. Papier & R. Suart (Eds.), *Handbook of vocational education and training: Developments in the changing world of work* (pp. 847–861). Springer. https://doi.org/10.1007/978-3-319-49789-1_106-1

Nisula, A.-M., & Metso, S. (2019). Factors fostering vocational students' workplace learning success in the real workplace environment. *Journal of Education and Work*, *32*(6-7), 552–569. https://doi.org/10.1080/13639080.2019.1673884

Pino-James, N., Shernoff, D. J., Bressler, D. M., Larson, S. C., & Sinha, S. (2019). Instructional interventions that support student engagement: An international perspective. In J. A. Fredricks, A. L. Reschly & S. L. Christenson (Eds.), *Handbook of Student Engagement Interventions* (pp. 103–119). Academic Press. https://doi.org/10.1016/b978-0-12-813413-9.00008-5

Powers, T. E. (2020). Motivated apprentices: The value of workplace and trade school. *Journal of Education and Work*, *33*(1), 81–97. https://doi.org/10.1080/13639080.2020.1716309

Powers, T. E., & Watt, H. M. G. (2021). Understanding why apprentices consider dropping out: Longitudinal prediction of apprentices' workplace interest and anxiety. *Empirical Research in Vocational Education and Training*, *13*(1). https://doi.org/10.1186/s40461-020-00106-8

Prümper, J., Hartmannsgruber, K., & Frese, M. (1995). KFZA. Kurzfragebogen zur Arbeitsanalyse. *Zeitschrift für Arbeits- und Organisationspsychologie*, *39*(3), 125–131.

Reegård, K. (2015). Sales assistants in the making: Learning through responsibility. *Vocations and Learning*, *8*(2), 117–133. https://doi.org/10.1007/s12186-015-9129-0

Reegård, K. (2018). Correction to: Sales assistants in the making: Learning through responsibility. *Vocations and Learning*, *12*(2), 341–341. https://doi.org/10.1007/s12186-018-9198-y

Rintala, H., Nokelainen, P., & Pylväs, L. (2019). Informal workplace learning. In J. A. Fredricks, A. L. Reschly & S. L. Christenson (Eds.), *Handbook of Vocational Education and Training* (pp. 1–14). Academic Press. https://doi.org/10.1007/978-3-319-49789-1_97-1

Rosenberg, M. (1979). *Conceiving the self*. Basic Books.

Schaap, H., Baartman, L., & de Bruijn, E. (2011). Students' learning processes during school-based learning and workplace learning in vocational education: A review. *Vocations and Learning*, *5*(2), 99–117. https://doi.org/10.1007/s12186-011-9069-2

Schwarzer, R., & Jerusalem, M. (2002). Das Konzept der Selbstwirksamkeit. In M. Jerusalem & H. Diether (Eds.), *Selbstwirksamkeit und Motivationsprozesse in Bildungsinstitutionen* (pp. 28–53). Beltz.

Shernoff, D. J. (2013). *Optimal learning environments to promote student engagement*. Springer. https://doi.org/10.1007/978-1-4614-7089-2

Stalder, B. E. (2011). T*he intellectual demands of initial vocational education and training in Switzerland*. Ratings for the period 1999-2005. University of Basel, Institute of Sociology. https://doi.org/10.7892/boris.131086

Stalder, B. E., & Carigiet Reinhard, T. (2014). Ausbildungsqualität aus Sicht von Lernenden und Betrieben in der Schweiz. In M. Fischer (Ed.), *Qualität in der Berufsausbildung – Anspruch und Wirklichkeit* (pp. 97–118). Bertelsmann.

Stalder, B. E., & Lüthi, F. (2018). Learning within and beyond the borders of schools and workplaces. In L. Moreno Herrera, M. Teräs & P. Gougoulakis (Eds.), *Vocational education & training - the world of work and teacher education. Emergent issues in research on vocational education & training Vol. 3*. Premiss förlag.

Stalder, B. E., & Lüthi, F. (2020). Job resources and career success of IVET graduates in Switzerland: A different approach to exploring the standing of VET. *Journal of Vocational Education & Training*, *72*(2), 189–208. https://doi.org/10.1080/13636820.2020.1721735

Stalder, B. E., & Schmid, E. (2016). *Lehrvertragsauflösung und Ausbildungserfolg - kein Widerspruch*. hep.

State Secretariat for Education, R. a. I., SERI. (2018). *Swiss Participation in European Research Framework Programmes*. State Secretariat for Education, Research and Innovation

Taris, T. W., & Feij, J. A. (2004). Learning and strain among newcomers: A three-wave study on the effects of job demands and job control. *The Journal of Psychology*, *138*(6), 543–563. https://doi.org/10.3200/JRLP.138.6.543-563

Taylor, A., & Watt-Malcolm, B. (2007). Expansive learning through high school apprenticeship: Opportunities and limits. *Journal of Education and Work*, *20*(1), 27–44. https://doi.org/10.1080/13639080601137734

Tims, M., & Bakker, A. B. (2010). Job crafting: Towards a new model of individual job redesign. *SA Journal of Industrial Psychology*, *36*(2), 1–9. https://doi.org/10.4102/sajip.v36i2.841

Tims, M., Derks, D., & Bakker, A. B. (2016). Job crafting and its relationships with person–job fit and meaningfulness: A three-wave study. *Journal of Vocational Behavior*, *92*, 44–53. https://doi.org/10.1016/j.jvb.2015.11.007

TREE. (2016). *Documentation on the first TREE cohort (TREE1), 2000-2016*. TREE.

Truxillo, D. M., Cadiz, D. M., Rineer, J. R., Zaniboni, S., & Fraccaroli, F. (2012). A lifespan perspective on job design: Fitting the job and the worker to promote job satisfaction, engagement, and performance. *Organizational Psychology Review*, *2*(4), 340–360. https://doi.org/10.1177/2041386612454043

Vermunt, J. K. (2010). Latent class modeling with covariates: Two improved three-step approaches. *Political Analysis*, *18*(04), 450–469. https://doi.org/10.1093/pan/mpq025

Weiss, H. M. (2002). Deconstructing job satisfaction. Separating evaluations, beliefs and affective experiences. *Human Resource Management Review*, *12*(2), 173–194. https://doi.org/10.1016/S1053-4822(02)00045-1

Wu, C.-H., & Griffin, M. A. (2012). Longitudinal relationships between core self-evaluations and job satisfaction. *Journal of Applied Psychology*, *97*(2), 331–342. https://doi.org/10.1037/a0025673

Xanthopoulou, D., Bakker, A. B., Demerouti, E., & Schaufeli, W. B. (2009). Reciprocal relationships between job resources, personal resources, and work engagement. *Journal of Vocational Behavior*, *74*(3), 235–244. https://doi.org/10.1016/j.jvb.2008.11.003

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology*, *25*(1), 82–91. https://doi.org/10.1006/ceps.1999.1016

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Moving From Fragmented to Seamless Sense-Making in Blended Learning

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Abstract

Context: Sense-making, understood as meaning making or giving meaning to experience, is an integral part of everyday life, work and learning, and is a process critical in enabling people to recognise how and when to respond to situations appropriately so that they can resolve problems effectively. Earlier studies on sense-making in educational or organizational settings tended to focus on the sense-making process per se in particular setting such as classrooms or organizations, few of them have paid much attention to the sense-making process in blended learning (BL). BL in vocational training mainly aims to enable adult learners to apply what was learnt in classrooms to solve authentic problems in workplaces or simulated settings. High quality of sense-making is crucial to help the learners achieve the aim. This timely study is to offer a comparative look at how different dynamics of BL interplay together to mediate the quality of sense-making in achieving learning outcomes. The dynamics include industry and training connections, policy and institutional contexts, the inhabited pedagogical practices and curriculum design.

Methods: This study adopted phenomenological and semi-ethnographic approaches, including semi-structured interviews, observations, analysis of relevant documents (e.g. curriculum and learning materials) to capture the rich data in case studies to understand learners' sense-making experience in BL. Researchers focused on seeking to understand how different environments, tools and artefacts mediate the quality of sense-making as the learners progressed through their learning journey. To triangulate the data, adult educators, curriculum

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designers and where possible, workplace supervisors, were also interviewed and observed for their perceptions and behaviours in learners' sense-making in BL.

Findings: The findings from two different BL courses (ICT and HR) surface that the degree to which learners' sense-making is fragmented (low quality) or seamless (high quality) is mediated by the interplay of different contextual factors in BL in multiple ways, such as, the connections (or not) with industry, the use (or not) of authentic problems and tasks.

Conclusion: The interplay between different dynamics in BL is of great importance to mediate the curriculum design and pedagogical approaches used in BL for high quality of sense-making of adult learners in vocational training.

Keywords: Sense-Making, Blended Learning, Curriculum Design and Pedagogies, Vocational Education and Training, VET

1 Introduction

Sense-making is understood as finding a way of thinking about diversity, complexity, uncertainties, ambiguities and incompleteness (Dervin, 1998). Building on Dervin's early work, educational (e.g., Harverly et al., 2020) and organizational studies (Weick, 1995; Weick et al., 2005) argue that sense-making is a sociocultural and cognitive process by which students/teachers/workers in educational or organizational settings interactively and dialogically make meanings and plausible explanations of their collective experiences of uncertainties or ambiguities. In educational settings, researchers claim that sense-making is a process in which students co-construct their understanding of the world as they generate, use, and extend their ideas in the classroom (Maskiewicz & Winters, 2012).

In this article, I explore how different sense-making features are distributed in two different blended learning courses: Information, Communication and Technology (ICT) and Human Resource Management (HR Management) to bring about different quality of sense-making, namely fragmented or seamless, for the learners in these courses. Additionally, I examine the impact of mediating factors, such as industry and Training and Adult Education (TAE) contexts, design and delivery of courses, on the quality of learners' sense-making in BL. The semi-ethnographic study (Bi et al., 2020) of six different courses by different training providers, which this article refers to, was conducted in Singapore to investigate how adult learners experience and translate sense-making across different blended environments.

2 Sense-Making and Learning

Sense-making in this article is conceptualised as a cognitive, sociocultural process. Sense-making occurs when people encounter something that is abstract, confusing, uncertain or new (Malitis & Christianson, 2014; Weick et al., 2005). The process is described as ongoing; there is no clear stop and start point. The absence of a beginning (or end) in sense-making means that people may not always consciously make sense of things – they just do so, as events unfold within their experience (Weick et al., 2005). Dialogue and interaction are integral to collective sense-making (Maskiewicz & Winters, 2012; Weick et al., 2005), and serve as a springboard to action (Albolino et al., 2007).

Weick et al (2005) identify features of sense-making as; noticing difference (resulting from, for example, feelings of uncertainty, that something is not quite right, new or abstract), followed by attempts at categorising and then labelling (naming) what is happening. The environment where sense-making takes place influences such processes, e.g. previous actions of self and others, protocols that "need" to be followed, the culture of the organisation. Thus sense-making is distributed across the organisation systemically. The next question asked in the process of sense-making is "What do I/we do now?" This is the action part of sense-making which is important in organizational sense-making; it always involves talking with others; thus communication is central to sense-making as a social process. In sum, sense-making,

1. Is noticing and bracketing organizing chaos;
2. Is about labelling and categorizing to stabilize the stream of experiences;
3. Is retrospective;
4. Connects abstract knowledge with the concrete instances;
5. Is social and systemic;
6. Is about organizing through communication; and
7. Is about what actions to take (Weick et al., 2005).

The different sense-making features identified in organizational studies represent strongly how sense-making is both a cognitive and a social process. For instance, when noticing the differences and labelling such differences in retrospective ways, workers may mainly rely on their own cognitive thinking to figure out unfamiliar scenarios. However, such scenarios are not existing independently within an organization, it may be related to other systemic phenomenon within the organization, therefore, individuals may have to make sense of such un-

familiar scenarios in a more holistic and systemic way situated in organizational culture. Inevitably, workers have to communicate with the people around in these unfamiliar scenarios to check if they are on the right track, e.g., their supervisors, peers in the organization. Therefore, sense-making is not only individualised but also collective. In the meantime, workers may take some actions to experiment their observations and interpretations in the unfamiliar scenarios. It is worthy to note that these features are not occurring in a linear way, all of them may occur iteratively without a start or a stop, particularly in the changing organizations. As a result, sense-making emerges as a critical capability for workers to quickly adapt and adjust to the constant changes in organizations. However, organizational studies on sense-making tended to only focus on such process per see, but not the quality of it and how organization discourse and practice may mediate such a process.

Another body of literature related to learning shows some implicit links with sense-making. Vygotsky's work provides a useful link, but somewhat different perspective from the work of Weick and others. Vygotsky's work was aimed at "generating an account of learning in which mind is making sense and externalising understandings by acting on the world using the tools available to change it for the better" (Edwards, 2010, p. 6). Action is mediated by the cultural and physical resources in our environments (contexts). Language and thus communication are such cultural tools that mediate actions, which finds some common ground with Weick et al.'s (2005) account of sense-making. Lave (1988) notes that cognition in everyday practice is distributed over mind, body and settings. Researchers such as Lave and Edwards, highlight the importance of mediation by cultural and physical tools in cognitive processes. Weick et al.'s (2005) sense-making features such as noticing, categorising, retrospectivity and so on, shows strong links with cognitive theories which provide further insights into sense-making. Kolb's experiential learning theory (1984) has been used in studies of high reliability organisations (Owen, 2009a, 2009b, 2017), suggesting it may offer more enlightening insights for the links between learning and sense-making.

Kolb's classical experiential learning theory (1984) comprises four elements: Experience, reflection, conceptualisation and experimentation. There is considerable connection between the four elements and the features of sense-making as listed from Weick et al.'s (2005) work. Ambiguity, confusion, uncertainty is a result of new experience; reflection and conceptualisation are where individuals and collectives look back, recall, make comparisons to begin the process of naming, categorising, linking to what is known from their own experiences and from theory; and active experimentation is putting that meaning–making into action. Such explicit connections show that Kolb's elements of experiential learning theory can be readily linked to sense-making processes as outlined by Weick et al. (2005). As a result, the strong links between sense-making and learning are well established in Kolb's work.

Though the strong links with learning, there is more to sense-making that needs to be understood. Firstly, sense-making is mediated by contexts. As Edwards (2010) and Lave (1988)

highlight, cognition is a socio-cultural process. Weick et al. (2005) identify culture and rules of an organisation in which sense-making occurs, naming this process as social and systemic, suggesting that sense-making is not just influenced by context, but mediated. Within any given contexts, the cultural, social and material factors all influence individual and collective sense-making, including actions which in turn influence the context/environment. Secondly, sense-making is an important capability for workers to solve authentic problems in order to adapt to the constantly changing needs at workplaces. From this perspective, sense-making is more than understanding and interpreting the uncertainties in unfamiliar scenarios, but with more emphasis on the appropriate actions that workers could be able to take to tackle the authentic problems, particularly those related to workplace practice. Therefore, sense-making emerges as an applicable and critical concept for further investigation in vocational training.

3 Why Sense-Making Matters in Blended Learning

With the advancement of educational technology, BL has been prevalent for the past two decades mainly in higher educational settings with the combination of both classroom and e-learning to meet the diverse learning needs and provide more access to learning. Numerous studies have been conducted to focus on the mediation of various factors, e.g. design features (technology quality, face-to-face support and learning management system and resources) (Beard et al., 2004; Kintu et al., 2017; Piccoli et al., 2001; Willging & Johnson, 2009); pedagogical approaches (Chen et al., 2019; Koh et al., 2016; Shorey et al., 2018; Strayer et al., 2015) and curriculum design in BL (Ahmad & Orion, 2010; Bhatti & Kaur, 2010; Koponen et al., 2011; Gleadow et al., 2015; Scardamalia & Bereiter, 2015; Velada et al., 2007; Korhonen et al., 2020) on BL experience and outcomes. For example, flipped-classroom approach has been widely used in BL in Singapore and international higher education contexts. However, the approach itself does not necessarily work well to achieve learning outcome if without deliberate curation of contents by educators to link classroom and e-learning. Without such deliberate curation, e-learning may only be used as a form of database to download learning materials (Chen et al., 2019). Equally important is the design of BL. Simply putting classroom and e-learning together without thinking about the learning needs of the learners and purpose of BL may cause challenges for learners to achieve their learning outcome. For example, face-to-face experiences form part of BL and learners' favour for such sessions may lead to better learning outcomes. Beard, Harper and Riley (2004) shows that some learners are successful while in a personal interaction with teachers and peers thus prefer face-to-face in the BL. In addition, the design of the activities in BL is of great importance to establish links across the different settings (Gleadow et al., 2015) to enable learners to achieve the desired learning outcome.

Relating BL to TAE, the components of BL have been broadened to include (simulated) workplace learning in many cases, but not all (IAL, 2016). Besides providing easy access and meeting different learning needs, one of the most desired purposes of BL in TAE is to enable the adult learners to take actions in applying theory into practice, so they are able to solve authentic problems at their own workplaces. Therefore, the concept of sense-making becomes highly relevant to BL in TAE, as its action feature is able to achieve such purpose. A common assumption is that including (simulated) workplace learning in BL may bring about the application and connection between theory and practices automatically (Chen et al., 2019). Such assumptions are misguided, as it is not the different settings but changed beliefs, provision of institutional support and opportunity that have an important role to play in changing pedagogical practices and curriculum design to mediate learners' sense-making quality in BL. More deliberate design and pedagogical practices in BL for TAE need to be planned and structured by considering the interplay of the dynamics beyond, e.g., broader industry and TAE contexts, policy and institutional contexts. However, until recently few studies have delved deeply into this area on the mediation of interplay of dynamics of BL on the quality of sense-making. Bearing in mind the distinctive features of sense-making as discussed in Section 2, therefore, the broadened BL in TAE pushes us to seek a more holistic understanding of how the dynamics of BL interplay to mediate the quality of sense-making.

This article makes a timely attempt to fill this gap. The study (Bi et al., 2020) on which this article is based, took place in Singapore where the government agency responsible for workforce development, SkillsFuture Singapore, was pushing forward an agenda to move from predominantly classroom-based delivery (Bound & Lin, 2011) to recognising and valuing workplace learning and using technology as an enabler for learning in and across classroom and work environments. A recent policy development, iN. LEARN (2020) emphasises the importance of promoting BL in Singapore's Continuing Education and Training (CET) (similar to Vocational Education and Training), as a way to enhance learners' access to learning and to meet their dynamic learning needs for the purposes of development for and in work. More specifically, BL in Singapore context consists of any combination of two or more components from classroom, tech-enabled, workplace learning spaces. In addition, to the ways in which these policies mediate use of technology, learning design and so on, remain unclear to us.

Therefore, a deep and holistic understanding of how the interplay of the dynamics of BL mediates the quality of sense-making is needed both theoretically and empirically. To fill this gap, specifically, this article aims to investigate the following questions:

1. What are adult learners' sense-making experiences in different BL courses?

2. How are different mediating factors working together for different sense-making experiences of adult learning in different BL courses?

4 Methodology

This study was drawn on different qualitative approaches to study adult learners' sense-making in BL; namely, phenomenology and semi-ethnography. Literally, phenomenology is the study of "phenomena": Appearances of things, or things as they appear in our experience, or the ways we experience things, thus the meanings things have in our experience (Woodruff, 2018). A phenomenological approach provides rich descriptive data capturing the phenomena of learners' sense-making. A semi-ethnographic approach provides an interpretive lens moving beyond the rich description and themes identified from the phenomenological data collection and analysis (Hammersley, 2010), allowing an analysis of enablers and constraints on learners' sense-making.

The unit of analysis in the two case studies is learners' sense-making experience in and across blended learning environments (Bi et al., 2020). The two BL courses, across two industry sectors (ICT and HR Management) were selected because of adult learners' distinctive sense-making experience in the courses, the comparison of these courses provides a rich description of the different impact of the mediating factors on learners' sense-making. In each BL course selected, three to four individual learners (anonymised) from each course were invited to participate in the study upon their consent. Semi-structured interviews, observations, and analysis of relevant documents (e.g. curriculum and learning materials) enable the capturing of rich data to understand learners' sense-making experience. Each selected learner was interviewed and observed at least two or three times throughout their entire course. Through these data, researchers focused on seeking to understand how different environments, tools and artefacts mediate the activity of sense-making as the learners progressed through their learning journey. To triangulate the data, adult educators, curriculum designers and where possible, workplace supervisors, were also interviewed and observed for their perceptions and behaviours in learners' sense-making in BL.

Table 1: Participants in the Two Selected Courses

Industries/ Courses		Learners	Adult Educators	Curriculum Designers	Workplace Supervisors	No of Interviews	No of Participant Observations
ICT	1	4	1	1	0	10	3
HR Management	1	4	3	1	0	12	4
Total	2	8	4	2	0	22	7

During preliminary data analysis using the seven features developed by Weick et al. (2005), it was found the seven features of sense-making identified in organizational studies need to be adapted and more nuanced in the setting of BL than the list provided earlier. Therefore,

the present study refined the seven features to better cater to the data analysis of the present study. Table 2 provides an explanation of each of the refined features evident in the data in the present study. These refined seven features were used to analyse adult learners' sense-making in the present study.

Table 2: Sense-Making Features Reconfigured in the Present Study

Sense-Making Features	**Explanation**
Noticing	A process of observing, identifying and experiencing similarities and differences across various situations, conditions and contexts.
Recalling	A process of recollecting, reconsidering and deliberating on past experiences.
Labelling	A process of grouping, comparing, naming and evaluating observed similarities and differences in knowledge learnt, conditions and contexts.
Connecting	A process of making efforts to link the theoretical and practical knowledge, individually or collectively.
Conceiving a systemic understanding	Developing ways of thinking to deepen understanding of aspects of professional concepts and practice within a wider context.
Communicating	Social and inter-personal processes to further understand what is learnt, e.g., asking questions, posing considerations, predicting, seeking clarifications.
Taking action	Iteratively translating / applying the sense-made, and reflecting.

The seven features of sense-making do not take place in BL always in linear sequence and in equal distribution. In different instances of sense-making, some features are more or less interrelated, more or less iterative, and some features may occur more frequently than the rest. For example, communicating tends to be interrelated more with the rest of the features and is thus a relatively prevalent feature in the sense-making process. In the literature discussed above, action is an outcome of the sense-making process, and as in Kolb's elements, may result in repetitions of sense-making processes. It is therefore useful to capture frequency of different features, as captured in Figure 1 and 2. These pie charts were generated by coding the observation and interview data to calculate the frequencies of different sense-making features evident in the data. As a result of different distribution of sense-making features, the adult learners in different BL courses tend to have fragmented or seamless sense-making as illustrated in the findings below. In addition, the various factors, e.g., the delivery and design of the courses, the partnership between training providers and employers, mediating the distributions are also explored to explain why different distributions of sense-making features in these BL courses are evident.

5 Results

The analysis of classroom observation transcripts and interview transcripts with adult learners, adult educators and curriculum designers in the two selected BL courses demonstrated how the different patterns of seven sense-making features may bring about different quality of sense-making for learner in these courses. The reasons behind the different patterns of sense-making features were also explored from the perspectives of the design and delivery of these courses.

5.1 ICT Learners: Why I am not so Confident to Apply What I Have Learnt in Classroom Into my Workplaces?

For ICT course, the training provider claims that the learner will gain in-depth knowledge of how SAP (System, Application, Products) ERP systems support business operations within specific functional or technical domains in an enterprise. With the certificate gained on completion of this course, learners are expected to be able to work as a SAP consultant whose job scope is to maintain the components and functionalities for SAP applications to fulfil customer's demand and to customize SAP applications to find and fix issues and recover the original functionality. The course is structured so that learners are engaged in e-learning (80%), and they have 24/7 access to e-contents for each module for one month. Learners who need help can approach tutors during tutorial sessions, where they are provided with one-to-one support regarding the course materials or technical matters. The remaining course (20%) was conducted via face-to-face flipped class lectures aimed at providing guidance to make sure that the learners are learning the correct skills and knowledge by themselves in e-learning.

However, at the end of the course, the learners shared that they still lacked the competence and confidence to apply for relevant jobs mainly because they were not provided with opportunities to apply what they have learnt nor had they experienced application in authentic settings. Their sense-making process as represented in Figure 1 explains why. Figure 1 is drawn according to the distributions of the different sense-making features in ICT learners' sense-making processes. Besides the distribution of these features, the interrelationship among the features is also marked by the dotted line. The interrelationship among the features means that different features may occur together in their sense-making, rather than independently all the time. Please refer to the legend in the figure.

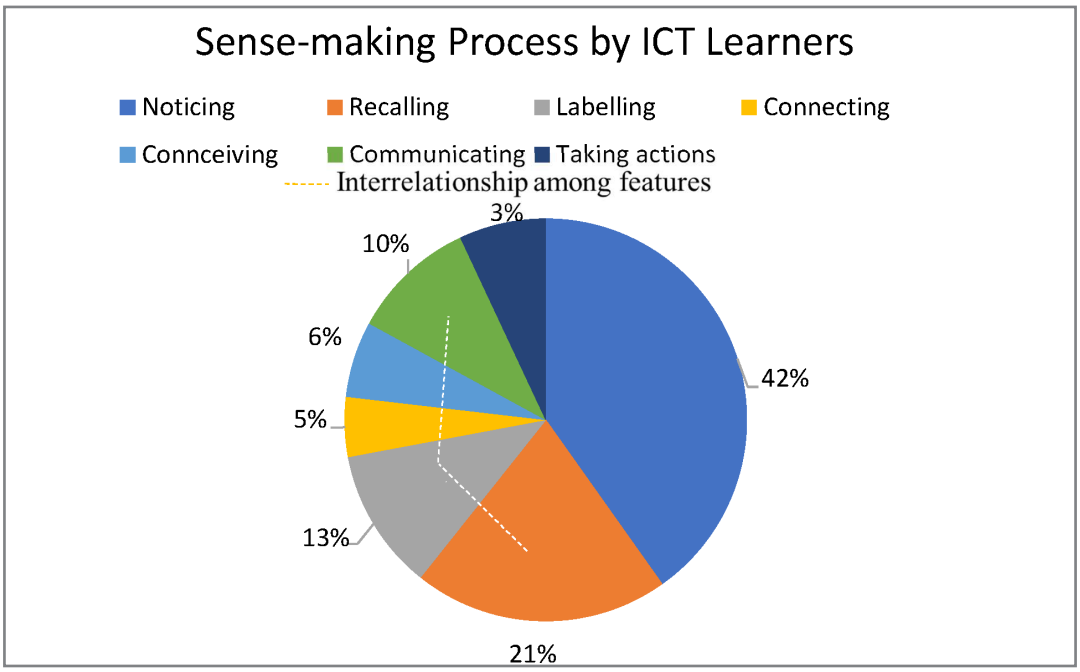


Figure 1: Sense-Making Process by ICT Learners

Figure 1 shows the adult learners in this ICT course spent most of their time noticing differences (42%), recalling past experience (21%) and making comparisons and labelling (13%). Comparatively, they seldom connected theory with practice (5%), or conceived a systemic understanding of the SAP program in relation to their organisation(s) or the context of their industry (6%). Another less evident feature in the data was taking actions to apply what they learnt (3%). All of the learners in this course spent much time recalling their past experience of using accounting systems and trying to identify the differences between the old and new systems, as well as identifying the discrepancies between the actual learning in the course and their expectations based on the enrolment information. The dotted line indicates that the sense-making features connected by the dotted line take place concurrently. In this instance, recalling and labelling, communicating and labelling. This suggests that their sense-making process are not well linked with different features, and thus limited.

Apple (one of the ICT course learners) commented that there was a mismatch between the learning outcomes as claimed by the training provider and what was experienced by herself.

> Their (school) aim is to equip the student to be an SAP consultant. *I can tell you that it's really not up to the standard*, if let's say you really want to have an all-rounded SAP. Unless you say that this consultant only focus on FI (Finance) and only asking question and translating the question to the SAP consultant. However, even so, we can only do the FI part, not the MM (Materials Management) or SD

> (Sales and Distribution) part. Just one part, so is it enough? Obviously if let's say like I said, unless you label this consultant only do FI, only do certain part. *Otherwise, if you just put SAP consultant, I think, cannot. You don't even know the MM or SD*. (Apple, Learner from ICT course)

Another learner, Sunny, had the same experience, stating that he did not feel qualified as a SAP consultant after the course even though the training provider would certify them as a SAP consultant:

> Yes, user-wise, there is enough experience for me. Now I can do post journal, everything that's basically what you need to be an accountant, as a user. They are teaching more as a user, than to be a consultant, but I don't think they have reached that level yet. Only classroom consultant yes, workplace consultant I don't think so…But you are certified as a consultant, you understand? Unless you have workplace exposure, experience, how the system works in the workplace, then you can be straightaway a consultant, junior consultant. But my company doesn't even use this system, I only have classroom experience [...]. And if I go to the company and say that I am an expert at this, which is ridiculous, I am only a classroom expert. (Sunny, Learner from ICT course)

In addition to the insufficient content coverage, Sunny also commented that such a mismatch may also be due to the lack of workplace exposure or experience of using the SAP ERP system. Such a comment echoed the low frequency of the feature of 'connecting' in ICT learners' sense-making. As shown in Figure 1, "connecting" appeared far less frequently in the all the sense-making features. This was mainly due to use of classroom and e-learning spaces, with no workplace learning or real case scenarios involved. The exercises the learners completed on the e-learning platform were not authentic and versatile enough for them to feel confident that they can become a SAP consultant in a company, as shown in another learner's (Berry) sharing:

> They are using the e-books which provided by SAP, so the requirement by the SAP is, that is a very good yardstick, so you really have to make sure you know all these things so it's good, another one is the, for us, practical session one, that is SAP assessed, okay, for us to assume this is a SAP software when you go to a company, this is for you to data entry, which is good, but we need someone to tell us in real life this can be done in this way but you can also, you have to be apply this book's knowledge and, to the real case job scenario. You mention that hospitals, that type of practical session so it's…Here don't have, that is the gap. (Berry, Learner from ICT course)

Without authentic application of a SAP ERP system, Berry further shared that she was not confident to apply for a relevant job with the certificate obtained from this course. The lack of such a component in this blended learning course may also contribute to low frequency of connecting theoretical knowledge and authentic practices by these learners. For example, all the examples in e-learning platform for learners to practice were designed strictly following the exercise on the textbook, which all the learners in this course felt that such exercises were out of their working context which requires a lot of customization for specific workplaces.

Learner's experience of BL in this course was one of frustration, and a huge gap between the promised outcomes and the reality of the course not equipping them to become SAP consultants as promised in the course materials. Basics such as systems failures, not being able to download materials readily, the reliance on workbooks, and the requirement that learners had to complete modules in a short time frame were all common complaints contributing to a focus on the lower quality of sense-making. Such complaints indicate disrupted and fragmented experiences hindering these learners to make a conceptualization of a systemic understanding of how the SAP ERP system may apply to their specific workplaces. Their sense-making was relegated to a kind of rote learning to ensure the right buttons in the SAP ERP system were clicked. Learners' comments that there was no opportunity to apply theory to practice suggest this is a missing element in the course design. What was taught in the course did not incorporate the versatility of the SAP system and the ways in which it can be applied differently in different settings. Instead, the course design and facilitation were very prescriptive where learners had to strictly follow the procedural steps.

5.2 Why Fragmented Sense-Making for ICT Learners?

The observation of the flipped classroom learning explained such fragmented sense-making for learners. During our observation, researchers noticed few classroom interactions between adult educator and learners or between learners took place. The classroom teaching was quite monologue with one-way feeding by the adult educator, who dominated and controlled the instruction content and pace. In such didactic teaching (Walklin, 1990), learners were seldom encouraged to ask questions, and share knowledge in some activities, e.g. groupwork discussions. Without the deliberate pedagogical approaches designed to encourage the learners to ask questions and share with each other about their own workplace experience (Chen et al., 2019), learners may lose the opportunism to make connections between theory and practice in order to be more competent to use SAP in their own workplaces (Gleadow et al., 2015).

Consequently, there was limited opportunity to develop a deep understanding of the possibilities for the deployment of SAP system in a company, which was the promised learning outcomes at the end of the course. Learners reported instead that they could only be a user, not operate at the higher level of consultant. Therefore, the learners explained that

the curriculum content was not adequate to meet most employer's needs and requirements in the industry. They strongly recommended that some embedded hands-on learning in between classroom and e-learning was necessary to help them achieve a holistic understanding of deploying SAP ERP system and be more competent and confident in applying for related jobs. Additionally, there appeared to be limited opportunity for learners to engage in purposeful dialogue. The following figure represents the fragmented sense-making experience of ICT learners in this course.

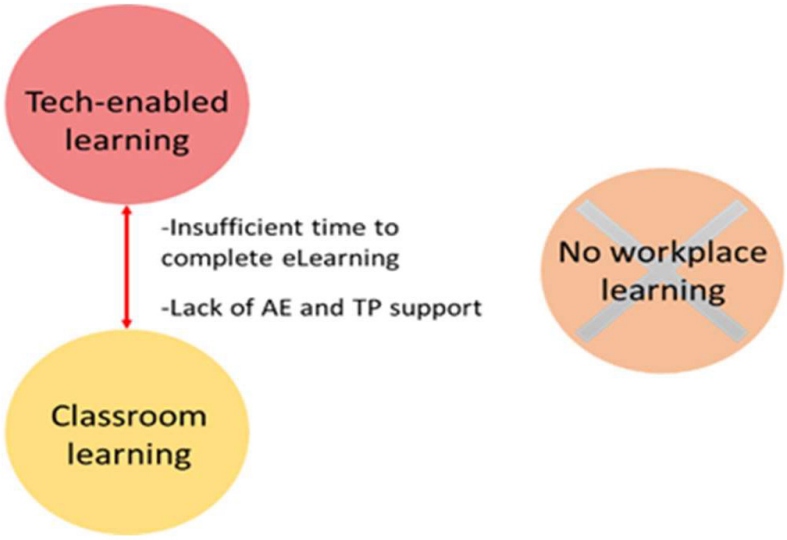


Figure 2: ICT Learners' Fragmented Sense-Making Experience in Blended Learning

The lack of clarity on the purpose of using BL is a contributing factor to the fragmented sense-making experience of these ICT learners and of their limited sense-making opportunities. At the time of data collection for this course, the course had been run by the training provider for six years, however BL had been in place for only six months. Before this, the course was delivered purely by classroom teaching over a nine-month period. The change into BL was the Provider's interpretation of policy changes; namely the government initiative to incorporate blended learning in all full qualification WSQ (Workforce Skills Qualifications) courses by Jan, 2017 in order to maintain the training provider's training subsidy. With such a change, the training provider appeared not sufficiently prepared to take learners' needs and capability development into consideration in terms of their own infrastructure and manpower readiness. Under such situation, the BL in this course appeared to be based mainly on a business decision by the training provider to comply with government policies and make the business sustainable.

5.3 HR Management Learners: I know What to do After the Course!

The HR course was mainly for the HR professionals in public service with at least five years of working experience. This course had three components of BL: Classroom, tech-enabled learning and workplace application to solve authentic HR issues at learners' own workplaces. The course lasted about two weeks with a final check-in for the sharing of their final project on authentic work-related issues four months after classroom teaching.

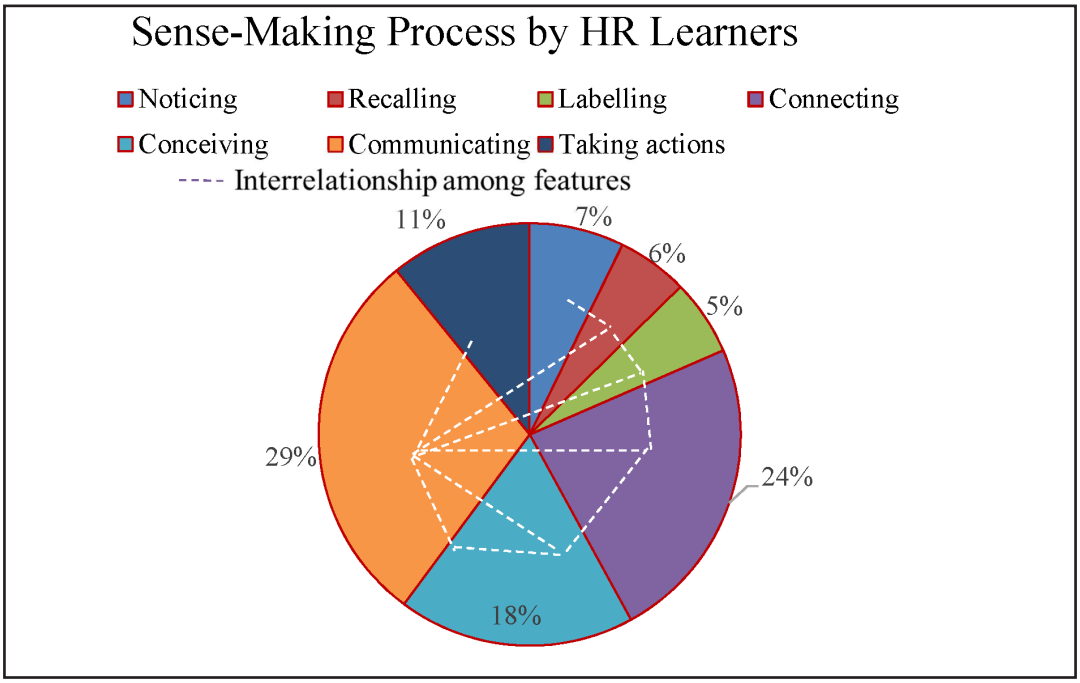


Figure 3: Sense-Making Process by HR Learners

Figure 3 shows that in the HR course, learners received more opportunities to make connections between theory and practices (24%) and to conceive a more systemic understanding of the industry practice and job roles (18%) throughout the entire course as compared with ICT learners. Comparatively, the rest of the features of sense-making were not so apparent in their sense-making process. In between these sense-making features, communicating with others was apparent too (29%). Most importantly, HR leaners were given the greatest opportunities to take actions to apply what they have learned into their workplace practices (11%).

The following excerpts from the HR learners' sharing are presented to show how the HR learners were making sense of the course in the deepest way as described in Figure 3.

> During the course we had quite a lot of speakers from public service division so they came to share on different things, l*ike the chief HRO shared on how the lands-*

> *cape is changing*, and then as a HR practitioner, how our roles are changing. Traditionally people look at HR more of an administrative, support function, but going forward, *the trend that has been happening is, they are looking at HR as a change agent, as a business partner at the same time, as a strategic partner at the same time*. So, there are a lot of roles that HR is expected to play, to take on in the future, which was actually quite nicely shared with us and help us in a sense to prepare for that thinking. Then with the new different technologies like automation all these, so what is the role that HR is supposed to play. Then if you are talking about all these technologies that organisations are pushing out, the fourth industrial revolution, how can HR bring value to this wave of change? So, we must be at the frontier of it, that means to do so, we must be the ones who are able to embrace this change, and probably pilot some of these changes at our own offices before we can ask the rest of the organisations to adopt this change. (Wilkie, Learner from HR course)

The sharing by Wilkie above revealed that he gained a holistic and systemic understanding of the future expectation and roles of HR professionals. By attending the sharing sessions conducted by industry experts from both private and public sectors, he realised that HR professional's future role is beyond just doing administrative work, rather it involves many different roles in order to adapt to the future trend of work. Specifically, HR professionals may need to assume a frontier role to initiate the changes in the future of work. Such a trend was inevitable for future HR professionals, going beyond common HR practices in certain companies. Guest speakers contributed to helping Wilkie develop a more systemic understanding of the HR role. Besides, Willkie also valued the dialogic approach used in this course as shown in the excerpt below.

> *Mainly for this course I realised that the learning is in a sense two-way. The lecturer, actually I wouldn't call them lecturers. They were more like facilitators. So, they facilitate the discussion.* It comes with their experience, what they have learnt before, and what are the work experiences that they can share with us […]. *Certain perspectives and then from our perspective we are able to contribute. And then bounce off the sharing from there. It is actually quite useful because the perspective that we have may be very different and then a lot of us come from different government agencies, so the background that we have are also quite different and the cases that we manage are also quite useful*. So that has been very helpful. (Wilkie, Learner from HR course)

During participant observation, we noticed that classroom interactions were not only between facilitator and the learners, but also between peers. All the learners in this course were from different government agencies with different working background. By interacting with facilitators and peers, Wilkie realized that such communication or conversations turned out to

be very helpful in terms of sharing the different perspectives on HR practices. Such communication gave him a more holistic view towards HR practices by enriching and broadening his understanding of standard HR practices in different government agencies. Pedagogical approaches and learner agency to initiate such communication in the learning process was quite crucial. The above example revealed clearly that adult educator in this course assumed a role more like a facilitator, rather than an authoritative lecturer dominating the classroom interaction with predetermined answers in didactic teaching (Walklin, 1990). At the same time, learners themselves also needed to take the initiative (and feel they are empowered to have the opportunities to do so) for the sharing of different HR practices in order to reach a broader and holistic understanding. The interview with the adult educator also revealed that he himself would also like to step back to give the classroom interactions more to the learners themselves to encourage their own sharing based on their own rich working experience.

In addition to the above features of sense-making process (connecting, conceiving and communicating), the HR course also provided quite good opportunities for the learners to apply what they have learned in the classroom to their workplace practices by doing a final project to address their real work issues (taking actions) as shown in the excerpt below.

> So, for my project, I'm actually doing HR analytics. When you talk about HR analytics itself, it's that we want to have an understanding of the profile of the organization. So, like for example in my company, we have like 2,000-over staff. So, we want to have a better understanding of what's the age group, what's the length of service, what is the gender, is there a trend that we are looking at? Even like when they […]. You may even be able to drill down to the number of MC (medical certificate) they have taken throughout the year and so on, to examine whether there are certain patterns. *Then it's that […], because when you take a look from analytics perspective, that it comes with a diagnostic, descriptive. Then what you can actually use such analysis is to help you to be able to make certain decisions*. Because in the past, when people talk about the way HR makes decisions, it's like this […], not really being supported by the data. But if you see the trend nowadays for HR movement, is we have gone big into like big data. We want to make more data-driven decisions. (Maisy, Learner from HR course)

At the time of interview, Maisy was at the stage of conceptualising the project. The process of conceptualisation by Maisy revealed that she was trying to use data analytics to analyse HR data she had to inform the HR decision-making in her own organization. She predicted what kind of analysis she could do with her own data and what kind of information she would like to gain from the data analysis. The final project was also part of the assessment for the course. Such a design element in the HR course helped learners make connections between theory

and practices effectively to apply such analysis to make changes in the organizations (features of taking actions).

What appeared to be important in enabling such sense-making for HR learners was the access to experiences that immersed learners in the complexities of the work they are learning about, be it through guest speakers, their own work issues that they base their capstone project on or, complex simulated experiences that are linked to real work experiences of these learners. Another important element in the such sense-making was the dialogic nature in the delivery of this course, which encourages learners to share their thinking for adult educators to "diagnose needs, devise learning tasks, enhance understanding, assess progress, and guide students through the challenges they encounter" (Alexander, 2019, p.12).

5.4 Why Seamless Sense-Making for HR Learners?

As compared with ICT course, the HR course offered a seamless sense-making experience for the adult learners. The course created more opportunities for learners to contextualise their classroom learning to their workplaces. Again, such a seamless sense-making experience was created by the curriculum design and pedagogical practices shaped by the interplay between industry and TAE contexts. The HR learners' seamless sense-making experience is depicted in Figure 4.



Figure 4: HR Learners' Seamless Sense-Making Experience in Blended Learning

The curriculum in this course was designed using a consistent narrative to form the backbone connecting and bridging different modules of the course. In addition, for each of the individual modules, there was a designated adult educator sitting through all the modules to link the module to the previous module as well as the module that came after the current

one. Learners from different agencies sat together to share experiences, deepening their exposure to different HR practices. In addition, HR experts from both the public and private sectors were invited to conduct some sessions with rich industry examples and experiences in the course. Importantly, learners were required to select an issue in their own workplace and develop a project to address the issue. The linking of modules, access to industry experts, dialogue and interaction, authentic learning and assessment were important in helping learners make seamless sense of HR practices from different perspectives.

One of the unique features of this HR course as shared by the curriculum designer was that it deliberately mingled in the HR professionals with finance professionals to create communication between them and enable a better understanding of each other's daily practices. Finance professionals were from another course conducted by the training provider. This intentional aspect of curriculum design offered learners more exposure to what is happening at workplaces in order to prepare them for future challenges and industry transformation. One of the adult educators revealed that a need was rising in the corporate services for HR departments to move beyond being a supportive department dealing with administrative routines and backend work, but to actively build collaboration with other departments related to resources, such as finance department, in order to serve the common goal of the organization. The learners shared in a very comparative way between HR and Finance practices which could facilitate better collaboration when they go back to their own organisations and have to work with such professionals. Such an understanding could also help the learners step out of the box of HR work as merely a supportive administrative process to instead, nurture a growth mindset, to affect other departments' work. Such a design of the blended learning represented the most authentic and current practices for HR professionals. By mingling with the financial professional, these HR professionals would be able to foresee what will happen in real work setting in connection with their own work settings (connecting), so that they would be prepared by the training to take appropriate actions (taking actions) if they encounter the same situation in their own work settings.

Another important feature of the curriculum design of this HR course was the incorporation of a workplace-related assignment for learners to solve their workplace issues by applying whatever they have learnt from the course to solve a real issue at their own workplace. Such an assignment enabled the seamless sense-making because it enabled the learners to make connections between abstract theory and concrete practices (connecting). The example of using data analytics helped learners identify the gaps in their HR practices and make decisions on what changes they can make at their own workplace. Such an assignment helped them revisit their own workplace issues in the more scientific way and make more informed decisions to enable the transformation in the HR industry to meet the needs for such transformation. As a result, learners' sense-making experience in this course tended to be seamless as compared with ICT learners as they were able to use what they learnt in the

course to make immediate application and take appropriate actions to address the issues at their workplace (taking actions). All the above shows that there was a clear purpose in the design and structuring of the course to help learners gain a deep understanding and make a seamless application of the current HR industry trends and practices in this blended learning.

Besides taking into consideration learners' needs in their curriculum design, the training providers' belief about teaching and learning (embodied in Adult Educator's pedagogical practices and training provider's learning facilities), also played a role in shaping the learners' seamless sense-making experience. The sharing from the adult educator in this course revealed that the training provider's belief in dialogic teaching (Alexander, 2019) and participative learning (Tsien & Tsui, 2007) embodied in the classroom setting tended to enable the seamless sense-making for the learners. One of the adult educators shared that he firstly had to establish his role in the classroom as a facilitator, rather than an expert. This move signalled to the learners that they had to share and learn collaboratively based on their own rich experiences which were highly workplace-related and authentic, by which the learners were then able to contextualize and link what they had learnt in the course with their workplaces and made more seamless transition and application between classroom and workplace. Such a belief in teaching and learning and intended pedagogies benefited learners' sense-making experience in this course. One of the learners shared that such active participation in learning with highly authentic case scenarios reminded her of the daily HR routine of dealing with different colleagues in the organization. At the same time, this created an authentic learning environment for her to move seamlessly between classroom discussion and workplace communication.

6 Mediation of Sense-Making

As the examples illustrate, sense-making is not an individual activity happening solely in the minds of learners. It is apparent from the literature on sense-making and the data examined in this article that sense-making, is very much a social process, requiring access to opportunity to experiences that enable the use of all features of sense-making (Albolino et al., 2007; Malitis & Christianson, 2014; Weick et al., 2005). The previous sections have focused on learners' sense-making, this section attempts to summarize and visualize how the interplay of these contextual factors may exert impact on sense-making.

Figure 5 illustrates the dynamic interplay in the TAE field between learning/curriculum design and facilitation of learning, and specific system issues and discourses, that influence sense-making opportunities. The nested ellipses in Figure 5 and the arrows between them, represent the interplay between learners' sense-making experiences and design and delivery (pedagogical practices) in blended learning, and the wider context of relations between training providers' interaction with industry. These interactions may either support or limit

currency of practices and knowledge in a given industry, and system matters such as funding, accreditation and discourses in the TAE sector. None of the players are powerless in the face of system experiences. Maisy, for example, showed great agency in her identification of where to link theory and practices in order to both finish the assignment and also tackle the real issues at her workplaces. The HR training provider and their educators were also greatly agentic in developing close collaborations with the industry partners by inviting industry experts and incorporating highly authentic industry-related project to create the seamless sense-making for their learners. Both implicitly and explicitly, such close collaboration mediated adult educators' pedagogical practices whereby they built up a facilitative role to encourage the leaners to share their authentic experience with each other and, provide opportunity for learners with authentic experiences enabling the use of the features of sense-making contributed to seamless sense-making.

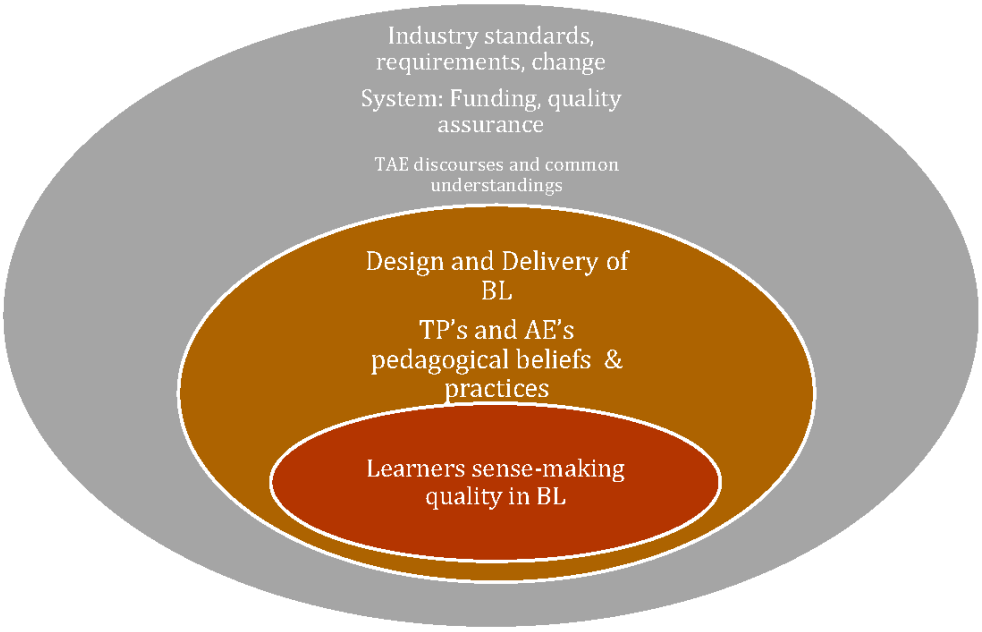


Figure 5: The Mediation of Sense-Making

Adult educators are the executors in delivering and facilitating blended learning courses; as such they are an immediate influence of adult learners' sense-making experience. Appropriate design and pedagogical practices can make a difference (Beard et al., 2004; Gleadow et al., 2015). As revealed by the findings, HR learners tend to experience seamless sense-making when they are offered more opportunities to share ideas, gain different perspectives from others and are exposed to different authentic workplace settings. Likewise, training providers have important contributions to make in ensuring learners to have access to opportunities

to engage in all features of sense-making. Their work and relations with industry partners emerges as important for learners' seamless sense-making in BL. As part of their everyday practices and inherent in their business models, it is argued here that training providers have a responsibility to ensure close working relations with their industry, use such relations as a means for continuous feedback and updating of courses, currency of staff industry expertise and to create supportive and meaningful experiences across different learning spaces of classroom, work, online, practice spaces and so on.

7 Conclusions

Sense-making is prompted by experiencing ambiguity, a dilemma, uncertainty and so on (Dervin, 1998; Weick et al., 2005) and achieving the high quality of sense-making is a critical part of BL as discussed above. To achieve the high quality of sense-making in BL, the implications for curriculum and learning designers, and facilitators of learning seem obvious. Namely, that learners working with their own many experiences of unresolved ambiguities, uncertainties and so on, provides a clear starting point in the design of teaching and learning. Where this may not feasible, or not provide adequate challenge, then compiling complex authentic dilemmas and/or providing materials and problems that prompt engagement in all the features of sense-making is a ready alternative. Features of sense-making contributing to seamless sense-making tended to appear more when work experiences or highly authentic experiences are integral to the curriculum and when dialogic teaching (Alexander, 2019) and participative learning are encouraged (Tsien & Tsui, 2007). However, what may seem obvious may be the exception rather than common practice. While institutional and policy responses may look initially to the professional expertise of educators and curriculum designers to address the issue, it is necessary to look beyond the issue of professionalisation. As evidenced in the accounts provided in this article, while curriculum and learning design and skilled facilitation can do much to address the opportunities for learners to use all features of sense-making, there are clear system issues and prevailing discourses and perceptions in the training and adult education sector that limit such possibilities.

System limitations and funding structures strongly mediate the degree to which learners' sense-making is fragmented or relatively seamless. Seamlessness of sense-making is enhanced when learning experiences are authentic (Chen et al., 2019), when there is constant feedback and communication from multiple sources (Alexander, 2019; Bi et al., 2020; Bound & Chia, 2020; Walklin, 1990), and of course when materials are current. However, when there is no requirement for regular updating of course content or design, and classroom funding is most prevalent, then the profit-driven private training providers (the principal providers in Singapore) will respond accordingly. Discourses and common practices such as just placing the tech-enabled learning to convert the course into BL, impact negatively on design

decisions; albeit that it does indeed result in uncertainty and a prompt for learners' sense-making. However, this represents lost opportunities for development of deeper learning and development of expertise. An alternative is provision for iterative movement between different learning spaces (e.g. classroom, practice spaces, laboratories, online, work), but this would need to be supported across the system. Both private and public providers, are subject to sector discourse and quality assurance policies. At the time of writing, the government agency responsible for the training and adult education sector is putting in place reforms. Despite system limitations, there are curriculum and learning designers and training providers who do operate in the liminal spaces enabling use of all features of sense-making as a seamless experience as shown in the HR BL course. In these ways, adult educators can challenge the system from within.

8 Limitations and Future Studies

Factors mediating sense-making may be a good start for further research on how these different systemic and contextual factors are working together to influence and mediate the quality of sense-making in different BL settings both locally and internationally. The comparison of the two case studies shed promising light for future research on how important the interplay of dynamic industry and TAE contexts are in mediating the quality of adult learners' sense-making. It reveals that simply putting different BL components together may not the ultimate solution to enhance the adult learners' sense-making. The intricate design of these components and the embedded pedagogical approaches emerged as more crucial to ensure the occurrence of all sense-making features, particular those enabling connection and application, which are the key features for more seamless sense-making.

However, it may be challenging for the findings from only two case studies of sense-making in BL in Singapore to be generalised broadly to international contexts with distinct industry and TAE contexts. Drawing on the findings of the present study, subsequent large-scale quantitative investigation on the correlations between these different systemic and contextual factors and adult learners' sense-making in various BL settings would be worth for future exploration. The quantitative investigation is expected to make contribution to a more holistic understanding of how system and contexts of BL mediate sense-making of adult learners in large sample of BL courses across more industry sectors. Practitioners and policy makers would also benefit greatly from such further quantitative exploration to inform their better practices in BL regulation and execution.

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References

Ahmad, N., & Orion, P. (2010). Smartphones make IBM smarter, but not as expected. *American Society for Training and Development*. https://www.td.org/magazines/td-magazine/smartphones-make-ibm-smarter-but-not-as-expected

Albolino, S., Cook, R., & O'Connor, M. (2007). Sensemaking, safety, and cooperative work in the intensive care unit. *Cognition, Technology and Work, 9*(3), 131–137.

Alexander, R. J. (2019). Whose discourse? Dialogic pedagogy in a post-truth world. *Dialogic Pedagogy: An International Online Journal*, *7*. Https://doi.org/10.5195/dpj.2019.268

Beard, L. A., Harper, C., & Riley, G. (2004). Online versus on-campus instruction: Student attitudes & perceptions. *TechTrends*, *48*(6), 29–31.

Bhatti, M. A., & Kaur, S. (2010). The role of individual and training design factors on training transfer. *Journal of European Industrial Training*, *34*(7), 656–672. https://doi.org/10.1108/03090591011070770

Bi, X. F., Bound, H., Mohamed, F., Cai, V., & Chuen, K. H. (2020). *Understanding adult learners' sense-making to inform pedagogical innovations in blended learning*. Institute for Adult Learning.

Bound, H., & Chia, A. (2020). *The six principles of learning design*. Institute for Adult Learning.

Bound, H., & Lin, M. (2011). *Singapore Workforce Skills Qualification (WSQ), workplace learning and assessment (Stage I and II)*. IAL.

Chen, Z., Ramos, C., Phua, L. D., & Cheng, S. C. (2019). *Training and adult education landscape in Singapore: Characteristics, challenges and policies*. Institute for Adult Learning.

Dervin, B. (1998). Sense-making theory and practice: An overview of user interests in knowledge seeking and use. *Journal of Knowledge Management*, *2*(2), 1–11.

Edwards, A. (2010). Knowledge work at practice boundaries. In A. Edwards (Ed.), *Being an expert professional practitioner, the relational turn in expertise.* Professional and Practice-based Learning, *3*. (pp. 41–60). Springer. https://doi.org/10.1007/978-90-481-3969-9_3

Gleadow, R., Macfarlan, B., & Honeydew, M. (2015). Design for learning – a case study of blended learning in a science unit. *F1000Research, 4*.

Hammersley, M. (2010). Ethnography. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopedia of education* (3rd ed., pp. 386–391). https://doi.org/10.1016/B978-0-08-044894-7.01533-5

Harverly, C., Barton, A, C., Schwarz, C. V., & Braaten, M. (2020). Making space: How novice teachers create opportunities for equitable sense-making in elementary science. *Journal of Teacher Education*, *71*(1), 63–79.

Institute for Adult Learning. (2016). *Blending classroom with work and technology: How to design a blended curriculum*. Institute for Adult Learning.

Kintu, M. J., Zhu, C., & Kagambe, E. (2017). Blended learning effectiveness: The relationship between student characteristics, design features and outcomes. *International Journal of Educational Technology in Higher Education*, *14*(7). https://doi.org/10.1186/s41239-017-0043-4

Koh, E., Shibani, A., Tan, J. P. L., & Hong, H. (2016). A pedagogical framework for learning analytics in collaborative inquiry tasks: An example from a teamwork competency awareness program. *Proceedings of the Sixth International Conference on Learning Analytics & Knowledge* (pp. 74–83). ACM.

Kolb, D. (1984). *Experiential Learning*. Prentice Hall.

Koponen, T., Tedre, M., & Vesisenaho, M. (2011). An analysis of the state and prospects of e-learning in developing countries. *International Journal of Education and Development using Information and Communication Technology*, *9*(2), 19–36.

Korhonen, A.-M., Ruhalahti, S., Lakkala, M., & Veermans, M. (2020). Vocational student teachers' self-reported experiences in creating eportfolios. *International Journal for Research in Vocational Education and Training*, *7*(3), 278–301. https://doi.org/10.13152/IJRVET.7.3.2

Lave, J. (1988). *Cognition in practice: Mind, mathematics and culture in everyday life*. Cambridge University Press.

Malitis, S., & Christianson, M. (2014). Sensemaking in organizations: Taking stock and moving forward. *The Academy of Management Annals*, *6*(1), 57–125.

Moran, D. (2000). *Introduction to Phenomenology*. Routledge.

Maskiewicz, A. C., & Winters, V. A. (2012). Understanding the co-construction of inquiry practices: A case study of a responsive teaching environment. *Journal of Research in Science Teaching*, *49*(4), 429–464. https://doi.org/10.1002/tea.21007

Owen, C. (2009a). Near-misses and mistakes in risky-work: An exploration of work practices in High-3 environments. In C. Owen, P. Beguin & G. Wackers (Eds.), *Risky work environments: Reappraising human work within fallible systems* (pp. 262–297). Ashgate.

Owen, C. (2009b). Toward developmental work in complex and fallible systems. In C. Owen, P. Beguin & G. Wackers (Eds.), Risky work environments: Reappraising human work within fallible systems (pp. 298–314). Ashgate.

Owen, C. (2017). *Enhancing learning in the workplace*. Paper presented at IAL Expert Roundtable.

Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic IT skill training. *MIS Quarterly*, *25*(4), 401–426.

Scardamalia, M., & Bereiter, C. (2015). Knowledge building: Theory, pedagogy, and technology. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (2ed ed., pp. 397–417). Cambridge University Press.

Shorey, S., Siew, A. L., & Ang, E. (2018). Experiences of nursing undergraduates on a redesigned blended communication module: A descriptive qualitative study. *Nurse Education Today*, *61*, 77–82.

Strayer, J. F., Hart, J. B., & Bleiler, S. K. (2015). Fostering instructor knowledge of student thinking using the flipped classroom. *Primus*, *25*(8), 724–735.

Tsien, T. B. K., & Tsui, M.-S. (2007). A participative learning and teaching model: The partnership of students and teachers in practice teaching. *Social Work Educationr*, *26*(4), 348–358. https://doi.org/10.1080/02615470601081654

Velada, R., Caetano, A., Michel, J. W., Lyons, B. D., & Kavanagh, M. J. (2007). The effects of training design, individual characteristics and work environment on transfer of training. *International Journal of Training and Development*, *11*(4), 282–294.

Walklin, L. (1990). *Teaching and learning in further and adult education*. Nelson Thornes.

Weick, K. (1995). *Sense-making in organizations.* Sage.
Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science*, *16*(4), 409–421.
Willging, P. A., & Johnson, S. D. (2009). Factors that influence students' decision to drop-out of online courses. *Journal of Asynchronous Learning Networks*, *13*(3), 115–127.
Woodruff, S. D. (2018). Phenomenology. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy*. https://plato.stanford.edu/archives/sum2018/entries/phenomenology/

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The Role of Vocational Education and Training in the Integration of Refugees in Austria, Denmark and Germany

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Abstract

Context: Vocational education and training (VET) plays a crucial role in the social inclusion of refugees. The aim of this paper is to examine how the VET systems of Austria, Denmark and Germany responded to the arrival of young refugees since 2015. VET in these countries is categorised as system of collective skill formation, which offers apprenticeships in addition to school-based training. The article examines and juxtaposes the legal rights, the actual opportunities and the barriers to refugees' participation in and completion of VET at upper secondary level in the three selected countries.

Methods: The study is based on reviews of literature and an analysis of refugee policies in the three countries. The literature search used a snowballing strategy and included policy documents, research publications and grey literature from organisations of civil society. The literature review employed a narrative, issue-focused approach to explore and compare key categories relating to the research question. To elaborate, refine and structure the categories

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for each of the three countries we used an input-process-output model and a combination of deductive and inductive analysis procedure.

Findings: The findings of the study are divided into six categories that structure the analysis: Admission requirements, validation of prior learning, vocational guidance and preparation, language training, social support measures and access to apprenticeships. The analysis reveals that both asylum seekers and recognised refugees have more opportunities in Germany than in the other two countries regarding the key categories. The findings show no major differences in the position of the social partners in the three countries in relation to refugees' participation in VET, however the national governments reacted differently to the influx of refugees. In Austria and Denmark, governments with strong anti-immigration agendas took office and reduced the access to and participation in VET for asylum seekers and refugees. At the same time, the German government introduced various integration measures for refugees in cooperation with employers with the aim of making VET more accessible to refugees.

Conclusion: To access and complete VET, refugees depend on supporting measures to overcome a variety of barriers, e.g. regarding language training and access to apprenticeships. Overall, reforms in Germany demonstrate promising initiatives to overcome the barriers to the integration of refugees in VET, while reforms in Austria and Denmark have limited refugees' opportunities to access and complete VET.

Keywords: Refugees, Social Inclusion, Vocational Education and Training, VET, VET System, Apprenticeship, Full-Time VET Schooling

1 Introduction

Between 2015 and 2018, more than 3.9 million asylum applications were registered in the European Union (Eurostat, 2019a). Refugees have a high risk of becoming unemployed or joining the expanding class of legal and illegal immigrants in low-wage and low-skilled jobs, thereby contributing to the dualisation of the labour market (Heidenreich, 2016). In many European countries, vocational education and training (VET)[1] is assigned a key role in integrating immigrants and refugees into education and employment (Jeon, 2019). A strong and attractive VET system is key to decreasing social inequalities and offsetting the growing dualisation of labour markets (Busemeyer, 2014). VET is crucial for the social inclusion, education and employment of young people from disadvantaged families who do not opt for higher education (Preston & Green, 2008). This is particularly the case for refugees, who

1 When we use the term VET in this article, we refer to both initial and continuing vocational education and training.

have often left behind their families, friends and social networks and have uncertain future prospects in the host country. VET provides specific skills that are relevant for the labour market and offers an effective and viable pathway to employment. The large majority of refugees have not completed any formal education beyond basic schooling (Winther et al., 2018), but they often have practical work experience that may be recognised in VET. In addition, during work-based learning in VET, refugees can enter the labour market and achieve a self-determined life in the host country.

Prior research, however, has indicated that migrants and refugees are disadvantaged in the education systems in Europe (Hillmert, 2013; Preston & Green, 2008). Studies show that migrants have lower achievement and higher dropout rates at the upper-secondary level and are at a higher risk of not being in employment, education or training (Dicks et al., 2018; Eurostat, 2019b). This is particularly the case in the VET sector (Beicht & Walden, 2019a). Refugees face considerable barriers and are underrepresented in VET due to language problems, employers' reserved attitudes (Phillimore & Goodson, 2006), discrimination and integration policy (Chadderton & Edmonds, 2015). In addition, low participation rates of migrants in VET programmes also result from self-selection mechanisms and "ethnic choice effects" (Tjaden & Scharenberg, 2017, p. 309). Due to their parents' high educational expectations and aspirations, many migrants decide in favour of academic tracks and against VET at upper secondary level (e.g., Busse, 2020; Jackson et al., 2012; Lessard-Phillips et al., 2014). This can be partly explained by immigrant optimism and information deficits with regard to the education system of the host country (e.g., Becker & Gretsch, 2016; Hunkler & Tjaden, 2018). Therefore, social support, vocational guidance and pre-vocational preparation are seen as important measures to ensure refugees' access to VET (Jeon, 2019).

The so-called "refugee crisis" of 2015 became a highly contested issue on national policy agendas. Strong anti-immigration forces questioned the previous humanistic position of established political parties. Schemes for the integration, education and training of refugees were opposed by demands for exclusion and repatriation. The outcome of these political upheavals affected opportunities to organise effective VET measures for integrating refugees. This makes it relevant to ask if the VET systems in the receiving countries are able to include refugees and support their social integration and transition to the labour market.

The aim of this study is to examine the legal rights, actual opportunities and barriers to refugees' participation in and completion of initial vocational education and training (IVET) in three European countries: Austria, Denmark and Germany. The three VET systems are all categorised as systems of collective skill formation, in which businesses and labour market organisations, in collaboration with the state, play an important role in the governance of VET (Busemeyer & Trampusch, 2012). Austria and Germany were among the European countries that received the most asylum applicants per capita (above 2%) for 2014–2018, while Denmark received less than half (0.84%) for the same period (Eurostat, 2019a). This

paper describes and juxtaposes (as described in Bereday, 1964) how the IVET systems of these three countries responded to the arrival of high numbers of asylum seekers in 2015 and the subsequent years, and it contributes to the discussion about the political economy (Busemeyer & Trampusch, 2012) of VET. So far, there is a lack of cross-European research on young refugees' access and barriers to IVET. Previous studies of refugees in VET have focused on either individual countries (e.g., Beicht & Walden, 2019a; Rabl & Hautz, 2018), adult learners and continuing VET (e.g., Chadderton & Edmonds, 2015) or specific learning settings (Choy & Wärwik, 2019). Thus, Webb et al. (2016) emphasised the need to examine VET policy differences regarding the integration of refugees and explore "how best to develop lifelong learning education to support increased mobility" and "social and economic integration" (p. 214). Our study addresses this need by examining the following research question: What are the central similarities and differences in access to and completion of IVET for refugees in Austria, Denmark and Germany?

First, the paper describes the structure of the three IVET systems under investigation as well as the position in VET of people with migration backgrounds in each country. We then present the study's research design and the criteria for juxtaposing refugees' opportunities and barriers in Austria, Denmark and Germany. Next, we explore the legal rights of refugees to participate in IVET in each of the three countries. At the heart of the paper, we outline the national refugee policy processes from 2015 to now along with the actual opportunities and barriers that refugees encounter in each national VET system. The conclusion discusses the capacities of the three national VET systems to include refugees and explores explanations for the differences identified.

2 VET in the Three Countries

In addition to school-based programmes, VET in all three countries offers apprenticeships (dual systems), where most of the training time (around 75%) is work-based. The apprenticing companies and the employer organisations are strongly involved in organising the training in close cooperation with the state. The close links between the education system and labour market are associated with low youth unemployment rates and a fast transition to employment after completion of the programmes (Preston & Green, 2008). The apprenticeship systems centre on practical and action-based forms of learning, and hereby, refugees can acquire vocational skills even if they have limited mastery of the native language. As part of their learning in the workplace, refugees can practise and develop language skills in real-world settings and extend their social networks.

While the three VET systems have many similarities, they also exhibit differences. In Austria, VET programmes attract a larger share (70%) of all students in upper-secondary education than in Germany (48%) and in Denmark (42%) (Cedefop, 2018, p. 61). While

more students in Austria attend school-based VET programmes, the large majority of VET students in the two other countries are in apprenticeships. In all three countries, apprentices attend part-time vocational schools for 20–30% of their apprenticeship time to acquire theoretical knowledge to supplement the company-based training.

The Austrian IVET system differs from the other two systems in its unique combination of dual apprenticeship training and full-time schooling (Graf et al., 2012). Apprenticeships and VET schools allow for different qualifications in similar vocational fields for young people at the upper-secondary level (e.g., Hautz & Thoma, 2021). Thus, VET in Austria provides a greater variety of opportunities and pathways than VET in Germany and Denmark. Despite this variety, it is traditionally difficult for non-EU immigrants to participate in education and the labour market in Austria (Huddleston et al., 2015). Studies (e.g., Aschauer & Seymer, 2019) have indicated that people with a migration background are strongly disadvantaged in the Austrian VET system. In particular, migrants from non-EU countries are underrepresented in the dual system and in full-time VET schools (Bichl, 2017). They mainly attend schools with a lower qualification level, for example, those with one- to two-year courses that prepare for social care or hospitality occupations (Herzog-Punzenberger & Schnell, 2012). Moreover, the risk of dropping out of education and training is seven times higher for this group compared to non-migrants (Steiner, 2009).

In Denmark, apprenticeships are preceded by a preparatory year of school-based training (a basic course) for basic vocational skills. In the second year, the students shift to an apprenticeship in a company that alternates with short periods of school-based training. Ethnic minorities have higher dropout rates and face a variety of difficulties in the Danish IVET programmes, especially in accessing apprenticeships. However, in some fields with labour shortages, the situation is more favourable, and in VET for social and health care, ethnic minorities make up 25% of the students (Danmarks Statistik, 2020). In addition to the IVET system, Denmark has an extensive public system for continuing vocational training (CVET) called AMU (Labour Market Training) (Andersen & Kruse, 2016). For immigrants and refugees, this system offers a variety of special targeted programmes with integrated language training.

The German VET system is renowned for its strong dual system of apprenticeship, which is highly valued in the labour market. In some sectors, such as the health and childcare sectors, VET is based on full-time school-based training (Hippach-Schneider & Huismann, 2019). In Germany in 2016, 29% of young people between 15–25 years of age had a migration background (Federal Statistical Office, 2018). The German VET system differs from the other two countries in the important role of vocational preparation, especially for disadvantaged groups. The so-called transition sector includes young people who have already left general education and want to prepare for a vocational training. There they learn vocational-specific skills and at the same time they can obtain a higher school certificate. This system has a high

proportion of young people with a migration background (Seeber et al., 2019), because they have greater difficulty obtaining an apprenticeship and are less likely to be trained in their desired occupation (Beicht & Walden, 2019b; Hupka-Brunner & Kriesi, 2013). In contrast, people with migration background are more often overqualified for their training place and are more likely to be offered training places in occupations that have a higher rate of contract termination (Bundestinstitut für Berufsbildung, 2014).

3 Research Design

VET in all three countries is categorised as system of collective skill formation (Busemeyer & Trampusch, 2012; Pilz, 2018). By comparing similar systems in the three different countries, we can get a broad picture of how this type of VET system has responded to the arrival of refugees, who represent a new group of potential students. We used a case-based approach for comparison by examining each VET system as a whole in the national context (following Bartlett & Vavrus, 2017).

First, we conducted a literature review with a narrative, issue-focused approach to search a wide range of criteria and provide a dynamic review (as set out by Ferrari, 2015). This approach is particularly useful for comparative research because different terms in different languages can be taken into account. Through a snowballing strategy, this extensive literature review expanded to include policy documents, legal acts and research publications. It also included grey literature, for example, project reports, websites from non-governmental organisations (NGOs) and documentation of local refugee integration measures to gain insights from the practitioner perspectives.

Second, we structured the findings of the literature review using an input-process-output model (Adams, 1993) to allow better comparability between the findings for each of the three countries. During this process, the capability approach (Nussbaum & Sen, 1993) was used to filter out the relevant categories for the research question. To ensure that we also included relevant unofficial publications prepared by civil society organisations and NGOs, we conducted a total of 16 interviews with experts and professionals in vocational schools and organisations. This gave access to a variety of empirical reports on barriers and success factors for refugees in VET, including vocational preparation and guidance, language training measures, job training and mentoring schemes.

Third, content analysis (Mayring, 2014) was used for the document analysis. We carried out the categorisation based on a combination of deductive and inductive procedures. Central categories were determined during the literature review and were subsequently modified and supplemented by categories inductively derived from the material. The findings of the document analysis were divided into six categories: Admission requirements, validation of prior learning, vocational guidance and preparation, language training, social support mea-

sures and access to apprenticeships. To ensure the reliability of the analysis, the results of the research from the individual countries were compared, discussed and agreed upon in a reflective examination of the material within the framework of an "analyst triangulation" (as described in Patton, 1990, p. 468).

4 Legal Rights for Refugees in VET

Refugees who are recognised, receive a residence permit and are guaranteed the right to education by international treaties ratified by the three countries. While it is clear that compulsory education must be freely available for all children, the treaties are less clear about the rights of asylum seekers to attend upper-secondary and higher education (Willems & Vernimmen, 2018). In this section, we examine the legal rights of refugees to VET at the upper-secondary level in the three countries.

Generally, asylum seekers are in a weak legal position concerning education and training, though they have more opportunities in Germany than in the other two countries. In Austria and Denmark, asylum seekers are excluded from apprenticeships. In Austria, access to IVET for young asylum seekers is partially legally permitted, as they are only allowed to attend full-time VET schools. During the asylum process, they are solely eligible for social welfare at a fundamental level (Asylkoordination Österreich, n.d.), and they receive no funding for transport or school supplies beyond compulsory education. Moreover, in Austria, only Syrian asylum-seekers "with high probability of being granted a residence permit" (Arbeitsmarktservice, 2021) are admitted to state-run integration courses that include vocational preparation measures. In Denmark, asylum seekers must participate in a basic introduction course 10 hours every week in the asylum centres. They can only participate in unpaid internships, not in regular VET programmes. In Germany, asylum seekers with expected residence permission already have access to integration courses during the asylum procedure. After the first three months of their stay, asylum seekers can attend pre-vocational training measures (Bergseng et al., 2019), and their opportunities for in-company training have improved with the Integration Act of 31 July 2016. If asylum seekers start an apprenticeship, they can have their residence permit extended until the end of their training period (Granato & Junggeburth, 2017).

If asylum seekers are recognised and receive a residence permit, they acquire most of the same formal rights to education and training as native citizens in all three countries. In Austria, they are entitled to social benefits and have free access to the labour market and, thus, to all apprenticeships. For integration into the education system, the labour market and social life in Austria, recognised refugees are obliged to participate in the "integration year" (Arbeitsmarktservice, 2021), which includes language courses, pre-vocational training measures and introductory courses to Austrian culture and history. In Denmark, recognised

refugees must participate in a standard integration programme, and since 2016, they have been required to start language and job training almost immediately. Refugees must cooperate with the municipality on a plan to become financially self-supporting. The methods vary considerably between the municipalities (Danmarks Evalueringsinstitut, 2019), but they are aimed mostly at acquiring employment within one year and only seldom at education in the regular VET system. A smaller group of refugees attend short training courses in the CVET system (AMU) that prepare them for un- and semi-skilled employment, or they attend the special two-year apprenticeship programme for refugees (IGU), which also serves as preparation for regular apprenticeships.

In Germany, both asylum seekers and recognised refugees can receive the same support from the Employment Agency as German nationals in terms of counselling, placement, support, activation and vocational integration (Der Paritätische Gesamtverband, 2017). They can take part in apprenticeship training, but they must acquire a work permit from the immigration authorities. At best, this will contain a concrete written confirmation of employment or a declaration of intent by the training company. For both asylum seekers and recognised refugees, part-time vocational training and the adjustment of the training period are possible as a way to enable the refugees' acquisition of professional and language skills. This manifests itself in an extension of the training period or in a reduction of regular in-company training time to promote language skills (Prakopchyk, 2017).

5 National Refugee Policy: Tensions Between Integrative and Exclusionary Strategies

In response to the arrival of a large number of refugees in 2015, the governments in all three countries launched various new initiatives to support integration through VET. However, at the same time, Austria and Denmark in particular introduced various anti-immigration measures that inhibited the participation of refugees in VET.

In Austria, following a decree in 2013, asylum seekers up to the age of 25 could get a work permit for apprenticeship training in understaffed professions. However, since 2015, the situation for asylum seekers has been very volatile due to political interventions. The Austrian government, NGOs and civil society have launched several new initiatives to support integration into and through VET. A nationwide initiative to enhance refugees' access to VET included the introduction of pre-vocational "transition classes" in 2015 (Bundesministerium für Bildung und Forschung, 2016). In these classes, refugees between the ages of 15 and 19 who were no longer of compulsory school age were prepared for upper-secondary education. However, this opportunity was abandoned in 2018 as part of the government's tightening of refugee policy. Since 2016, the Austrian government has established a large number of anti-immigration measures to create "one of the toughest asylum laws in Europe" (Brickner &

Krutzler, 2016). This included temporary asylum (limited to three years) and restrictions of rights to welfare and family reunion. Moreover, the government implemented stricter access to VET for refugees. The opportunity to get a work permit for apprenticeships was ended in 2018, and even repatriations for apprentices took place until the end of 2019 (Asylkoordination Österreich, n.d.). While a new act in late 2019 has enabled asylum seekers to finish their apprenticeships also in cases of negative asylum decisions, no new apprenticeships can be started by asylum seekers in Austria. In contrast with countries like Germany, asylum seekers in Austria do not get any legal security or residence status during education and training. For recognised refugees with a permanent or temporary residence permit, the situation is better. They retain the legal right to take up apprenticeships in all sectors. Their opportunities in VET are mainly negotiated between the two chambers in Austria (i.e., the Chamber of Labour and the Chamber of Commerce) and are less dependent on the political climate. However, their real opportunities for participation in VET are impeded by a variety of barriers (Rabl & Hautz, 2018), as we will describe later.

In Denmark, the response of the new government in 2015 to the arrival of many refugees was to introduce numerous reforms with two aims (Bredgaard & Ravn, 2018). One aim was to discourage refugees from seeking asylum in Denmark through tough anti-immigration measures, for example, significantly cutting their financial allowances. The other aim was to promote refugees' fast integration into the labour market. This marked a significant shift in integration policy from the previous priority of human capital investment in education and language training. Following tripartite negotiations with labour market partners, various new initiatives were taken to organise supported employment, job-training initiatives and new measures in VET. An innovation among these was the two-year Basic Integration Programme for refugees, IGU, introduced in 2016 by the government in cooperation with labour market organisations (Bredgaard & Ravn, 2018). The IGU is a successful apprenticeship programme with certification that combines language training, work-based training and full-time school-based VET courses. However, these measures apply only to recognised refugees, as asylum seekers are not allowed to take part in paid work or regular education. With a reform in 2017, completing an education no longer improves refugees' chances of acquiring a permanent residence permit. This is meant to give refugees more incentive to seek employment even though education has been shown to improve the long-term employability of refugees (Arendt, 2018). In addition, the integration allowance for refugees was reduced significantly to encourage them to find a job. A major reform of the integration policy in early 2019 emphasised that, generally, asylum is only temporary, and the policy's overall aim changed from integration to repatriation of refugees. This has made the future more uncertain for refugees and made it less useful to engage in education with a long-term perspective. It has also reduced the inclination of employers to take on refugees in apprenticeships, which typically have a duration of three years (Bredgaard & Ravn, 2018).

In 2016, Germany passed a new Integration Act after receiving more than one million asylum seekers. The act included measures and incentives to promote the participation of refugees in training, language courses and active labour market measures. Access to VET was previously not allowed for asylum seekers, as they did not have the required work permits (Schroeder & Seukwa, 2017). This was changed in 2015. Starting in January of that year, the German government reformed Asylum Package I. The reforms focused primarily on asylum and residence law but also on new regulations, such as the revision of the Law on the Right of Residence (Wissenschaftliche Dienste des Bundestags, 2016). A further change was that toleration must be granted if an asylum seeker begins or has already begun qualified training, and employment bans were lifted. In addition, since then, a residence permit is granted for the total duration of the apprenticeship, as stipulated in the training contract. Asylum seekers whose asylum applications are rejected during training have the opportunity to receive a "training tolerance period" to complete their training. In such cases, however, an individual case examination by the Foreign Department is required (Deutscher Industrie- und Handelskammertag, 2017, p. 13). After completion of vocational training, a residence permit is issued for two years for the purpose of gaining employment that corresponds to the vocational qualification acquired. This legal innovation is known as the "3+2 regulation" (Deutscher Industrie- und Handelskammertag, 2017, p. 28) and is intended to give asylum seekers and employers more planning security, thus promoting integration through training. However, tolerated persons from "safe countries of origin" (Deutscher Industrie- und Handelskammertag, 2017, p. 28) who applied for asylum after 31 August 2015 are not entitled to this regulation. In Germany, many different measures have been launched to support refugees' participation in VET. For example, the programme *Berufsorientierung für Flüchtlinge* (Vocational Orientation for Refugees) (Bundesministerium für Bildung und Forschung, 2020) prepares refugees for vocational training by teaching technical language and specialist skills and providing individual mentor support. Another initiative called Companies Integrate Refugees is considered Germany's largest association in this field. The content includes know-how on legal issues, funding opportunities, tips on cooperation and integration of refugees into training and employment.

In all three countries, the so-called "refugee crisis" of 2015 placed VET in a field of political tension, where the governments launched numerous initiatives with two partly conflicting objectives. One was to make it less attractive to seek asylum in the country, for example, by introducing temporary asylums, limiting access to education and lowering the financial benefits and living conditions of refugees. The other was to support the social integration of refugees and, in Germany, even of asylum seekers by introducing new programmes and supporting measures in VET.

6 Comparison of Actual Opportunities and Barriers for Refugees in VET

Our examination has shown that *asylum seekers* have almost no formal rights to participate in the regular VET programmes in Austria and Denmark. For *recognised refugees*, the situation is different. Generally, they largely have the same formal legal opportunities to participate in VET as native citizens, though some rights might differ depending on their asylum status (temporary, permanent or Geneva protection). In the period of 2015–2020, the three countries had favourable conditions for successful integration of refugees into the labour market through VET because they had low unemployment rates and even shortages of labour in some industries (e.g., hospitality, agriculture, cleaning, etc.).

However, our study of the three countries has found considerable barriers to refugees' access to and completion of VET. The barriers are similar to those identified for immigrants (Bergseng et al., 2019; Jeon, 2019). Some barriers are related to the refugees' prior experiences, which can include trauma caused by persecution in their homeland, their subsequent flight and living under precarious and insecure conditions for extended periods. After arrival in a European country, they might experience resettlement and acculturation stress due to family separation, discrimination and the insecure situation of protracted periods waiting for asylum (Bauböck & Tripkovic, 2017). Refugees are confronted with language and cultural barriers, and the government's emphasis on temporary asylum in Austria and Denmark raises uncertainty about the future (Baranik et al., 2018). This can lead to disappointment and demotivation and make it difficult for refugees to start VET and take control of their lives in their new environment. In addition, our examination revealed various VET-specific opportunities and barriers for refugees, which are described in more detail in the following. Table 1 illustrates an overview of the most important differences between the three countries regarding VET-specific opportunities and barriers.

Table 1: Overview of Opportunities and Barriers in VET for Refugees

	Austria	Denmark	Germany
Admission requirements	Successful graduation certificate for the 8th school year for access to full-time school-based VET. Completion of compulsory education, but no school graduation certificate, for access to the dual system.	Successful graduation certificate for the 9th grade with leaving exam (Grade 2 or higher) in maths and Danish (Level G) or similar qualifications acquired in another way.	Successful graduation certificate for the 9th grade for access to full-time school-based VET. Different school-based training programmes require different school-leaving qualification, details vary across the federal states. Completion of compulsory schooling, but no successful graduation certificate for access to the dual system.
Validation of prior learning	Not a standard part of regular IVET programmes.	Basic screening of qualifications by asylum centres; validation in the regular IVET programmes, but not a standard in the CVET system.	Not a standard part of regular IVET programmes; validation process varies across the federal states.
Vocational guidance and pre-vocational preparation	Offered for recognised refugees and Syrian asylum seekers with expected residence permission during the integration year. *Transition classes* for refugees were abolished by the government in 2018.	Vocational guidance is not a standard, but can be part of the regular integration programme for refugees. The IGU programme can serve as pre-vocational preparation.	Preparatory vocational courses are available in certain IVET schools for school-age refugees. Companies can apply for funding for preparatory courses for non-school-age refugees.
Language training	Limited offers for asylum seekers; mandatory for recognised refugees, but only offered up to language level A2 by the state.	Language training is an integral part of special apprenticeships for refugees and of some programmes in the CVET system.	Mandatory for all refugees, but there is a lack of teachers and poor standards for language training providers.
Social support	No nationwide support system; depends on volunteers and NGOs.	No nationwide support system; differs among municipalities.	Various support measures are provided for different stages of IVET.
Access to apprenticeships	Possible only for recognised refugees; access limited due to lack of support measures and language skills.	Possible only for recognised refugees; access is limited due to lack of language skills and support measures.	Possible for all refugees; *Welcome Guides* support companies in searching for and integrating refugees.

6.1 Admission Requirements for VET

Due to language problems and incomplete basic education, it can be very difficult for refugees to meet the entrance requirements in VET. In Denmark and Austria, inadequate language skills make VET almost inaccessible for refugees, since language training for asylum seekers beyond compulsory education is only available to a limited extent during the asylum procedure. Moreover, access to full-time VET in Austria requires a successful school graduation certificate for the eighth school year, which many refugees are unable to prove. For access to the dual system in Austria, the completion of nine years of compulsory education is required, although school graduation is not. Apprenticeship companies determine further admission requirements based on their own criteria. In Denmark, asylum seekers must participate in 10

hours of weekly training in the Danish language and introduction to Danish society. However, the level of language training is much below the entrance requirements for IVET. In 1997–2017, after receiving a residence permit, it took, on average, around five years before young refugees would start IVET (Nielsen-Gravholt & Jans, 2020). After the new restrictions of 2016, early compulsory job training (work first policy) weakened refugees' opportunities to acquire Danish language skills (Arendt & Bolvig, 2020). In addition, the VET reform in 2015 raised the entrance requirements (see Table 1) and reduced refugees' opportunities for accessing IVET.

In Germany, refugees are required to have completed the compulsory schooling years, but no graduation certificate is required before starting an apprenticeship. Companies select apprentices according to their own recruitment criteria (Granato & Ulrich, 2013). Some companies do not recruit refugees due to their perceived poor German language skills and lack of expertise (Werner, 2018). To participate in full-time school-based qualifying training programmes, a certain level of language proficiency and completion of lower-secondary education is required. A specific school-leaving qualification is a prerequisite for certain types of full-time school-based training programmes. The exact requirement varies depending on the federal state.

6.2 Validation and Recognition of Prior Learning

Many refugees are unable to document their work experiences, and therefore, practice-based forms of validation of their prior learning are required. The validation of prior learning is regulated by law in all three countries and is a standard part of regular vocational programmes in Denmark, but not in Germany and Austria, where validation is done at the refugee's request. Validation is not used systematically in the Danish CVET system (AMU), which is most often used by refugees. Danish asylum centres must screen the refugees' qualifications but are not required to ensure proper validation (Thomassen, 2019). In Austria, a study by Eggenhofer-Rehart et al. (2018) showed that refugees' educational certificates are largely devalued by authorities and are assigned to lower levels of domestic education. In addition, some qualifications in Germany can only be validated to a limited extent due to, for example, different training systems (Winther et al., 2018).

6.3 Vocational Guidance and Preparation (Pre-Vocational Programmes)

Refugees have difficulties navigating the education system and need vocational guidance and preparation to make informed choices and reduce the risk of dropping out. In all three countries, preparatory vocational courses for refugees are part of the integration programmes. In Austria, vocational preparation and guidance are offered as part of the integration year

for recognised refugees and Syrian asylum-seekers with expected residence permission who have completed compulsory schooling (Arbeitsmarktservice, 2021). This pre-vocational programme lasts 6–12 months and includes career orientation, application training, training for vocational qualifications, language skills and on-the-job training (Arbeitsmarktservice, 2021). Asylum seekers who are not from Syria, however, have only scarce offers from NGOs, as they are not available throughout Austria. In Denmark, only limited vocational guidance for refugees is included as part of the standard integration plan for the three- to six-week introduction courses and the following repeated internships in companies, which are typically 13 weeks (Bolvig & Arendt, 2018). In addition, the two-year apprenticeship programme for refugees (IGU) can serve as preparation for the regular VET system. In Germany, preparatory vocational courses for refugees are available in some vocational schools for school-aged refugees. Companies and other IVET providers can apply for funding for preparatory courses for non-school-age refugees. The focus is on combining language support with vocational orientation and support in finding a profession and initiating a training relationship (Bundesamt für Migration und Flüchtlinge, 2017a). A basic course (PerJuF) lasts between 12 and 32 weeks. In all three countries, female refugees have far lower participation rates in VET than males, and targeted guidance measures are required to support their participation (Liebig & Tronstad, 2018).

6.4 Language Training Before and During VET

To keep up with the training, refugees typically need supplementary language training before and during a VET programme. In Austria, language courses are only offered to a very limited extent during the asylum process. Depending on the federal province, only one to four hours of language training per week are offered free of charge by state institutions, and only a small number of asylum seekers are reached by these measures, as transportation is not provided (SOS Mitmensch, 2017). In 2017, language courses were made mandatory for recognised refugees. These are usually only offered to language level A2 and, therefore, provide limited support for starting and completing a VET programme. Some vocational schools and NGOs offer advanced language training for refugees, which is provided freely by teachers and volunteers. The offer of more advanced German courses varies constantly, depending on funding. The Danish IVET system is almost inaccessible to refugees due to language requirements and the restrictive integration policy. In the Danish CVET system, Danish language training is an integral part of various special courses for immigrants and refugees. In the two-year apprenticeship programmes for refugees (IGU), the Danish language is taught in close connection with vocational training, which has shown very good results (Rambøll, 2018). In Germany, the government responded to the increase in refugees by introducing numerous language support measures through integration courses (Bundesamt für Migration und Flüchtlinge,

2017b). Participation in these courses has been mandatory for refugees since 2016. However, if the person has already begun vocational or other training in Germany or can prove participation in a comparable training programme, there is no obligation to attend an integration course. In view of this rapid development in demand for language courses, the providers of language courses have often been unable to find the necessary suitable teachers for all the courses offered. The quality of the language courses suffers from the lack of teachers and the poor standards of the providers (Kaufmann, 2016).

6.5 Social Support Measures During VET Training

To start a VET programme and successfully complete it, refugees require continuous social support that covers all spheres of life. In Austria and Denmark, the social support offered for refugees during VET differs considerably among municipalities and educational institutions (see e.g., Asylkoordination Österreich, n.d.; Bolvig & Arendt, 2018). In the first years after the 2015 influx of refugees, many municipalities established support teams to help refugees manage their challenges. In both countries, some municipalities engaged integration guides and mentors to support refugees and cooperate with vocational schools and employers. Danish municipalities have an undivided responsibility for the integration process, which promotes a holistic support (Thomassen, 2019). However, many of the Danish initiatives were abandoned after 2016, when the number of refugees arriving dropped sharply. In Austria, the continued existence of most initiatives depends on the efforts of volunteers and NGOs (Rabl & Hautz, 2018). A comprehensive nationwide support system, which would help refugees replace a missing social and family environment, does not exist in either of these two countries. In Germany, there are various measures to help companies integrate refugees. These include the external support measure assistance during training A (AbH). AbH organises support classes and socio-pedagogical assistance for training refugees. AbH also offers support to stabilise the training relationship and provides support for young refugees. However, a study by the German Economic Institute (Werner, 2018) showed that many companies are not aware of these support measures and only inform themselves when concrete problems arise. Companies that know about the support measures employ significantly more refugees.

6.6 Access to Apprenticeships and In-Company Training

Compared to other students, refugees and immigrants have fewer chances of obtaining an apprenticeship contract. Many apprenticeships are distributed via informal social networks, and some employers are cautious about taking on ethnic minorities due to assumed cultural and language barriers (Phillimore & Goodson, 2006). Therefore, refugees are in a disadvantaged position compared to native students in all three countries. Nevertheless, in Austria,

apprenticeship for recognised refugees is the most promising option for successful participation in VET (Hosner et al., 2017). In most cases, however, access to dual training in Austria is only successful if refugees are given intensive support by social workers and volunteers in finding and applying for an apprenticeship, in bureaucratic matters and in finding accommodations (SOS Mitmensch, 2017). In the regular Danish IVET system, ethnic minorities are overrepresented in the full-time school-based programmes. However, many vocational schools and municipalities cooperate with employers to engage refugees in the special apprenticeship programme for refugees (IGU) aiming at industries with labour shortage (Rambøll, 2018).

In Germany, refugees have a greater chance of finding a training place in companies with a shortage of skilled workers. *Welcome Guides* support these companies throughout Germany in the integration of refugees. They arrange contact with refugees and advise companies that offer internships, training positions or employment opportunities for refugees. In addition, they inform companies about offers of assistance and support (Kompetenzzentrum Fachkräftesicherung, 2020). Despite the various support measures for the integration of refugees in Germany, the prior experience of companies seems to play the most important role in access to apprenticeships for refugees. This is because companies that employ staff with a migration background and already have experience with refugees are often involved in this process (Werner, 2018).

7 Conclusion

Asylum seekers arriving in Austria, Denmark and Germany came in a period of low unemployment and high demand for skilled workers in many industries. In all three countries, labour market organisations generally supported measures to give refugees access to VET to meet the demand for labour and to reduce the risk that refugees would add to the growing precarious class of unskilled immigrants. As these organisations have a strong position in VET, this could give VET a key role in the integration process. In all three countries, recognised refugees have the right to participate in school-based vocational education and apprenticeships on equal footing with native students. However, our study found that in Austria and Denmark, the actual opportunities for recognised refugees to enter the regular IVET system are very limited and that asylum seekers have no right to participate in the dual VET system. In Austria and Denmark, reforms in response to the so-called "refugee crisis" have reduced both groups' access to VET. This is due to new forms of temporary asylum, high admission requirements and the work first policy. The response in Germany was to expand both asylum seekers' and recognised refugees' access to VET, for example, by granting residence permits for the total training period and two additional years of employment. In addition, extended part-time vocational training in Germany supports refugees' combined acquisition of

language and vocational skills. This is also possible in the special apprenticeship programme for refugees (IGU) in Denmark, which was introduced parallel to the restrictive reforms.

How can we explain the differences between the three countries, whose VET systems have many similarities regarding structure and governance? We have found no substantial differences in the position of the social partners in the three countries in relation to refugees, but the governments have reacted differently. In Austria (from 2016) and Denmark (from 2015), new governments took over with a strong anti-immigration agenda. In these two countries, an exclusionary political response became dominant, and the governments' negative position on immigration and refugees took precedence over their interest in upskilling refugees and immigrants in VET to meet the demands of the labour market. In contrast, the German government introduced new integrative measures in cooperation with employers to improve VET opportunities for refugees and asylum seekers.

All three countries have strong apprenticeship systems that are recognised and admired internationally for providing easy pathways to employment for disadvantaged youth (Preston & Green, 2008). However, our study has found that this does not include refugees because they, similar to immigrants, lack social networks that provide access to apprenticeships and are subject to discriminatory practices by some employers (Jeon, 2019). In addition, the shift in Austria and Denmark to granting only temporary asylum gives refugees and employers few incentives to enter into apprenticeships that have a duration of three to four years. A variety of initiatives in Germany, such as the Welcome Guides and the Danish apprenticeship programme for refugees (IGU), are successful examples of measures to combat these disadvantages.

Our study shows that, to access and complete VET, refugees depend on supporting measures to overcome a variety of barriers in all domains of life. This is especially the case for women, who have very low participation rates in education and employment in all three countries. We have highlighted some key barriers and some promising initiatives to overcome them in the three countries. It must be expected that refugees will continue to be a challenge for Europe due to armed conflicts, climate change and global inequalities. Therefore, it is important to learn from the recent events in order to improve the general integration policy and the specific measures for refugees in VET for the next "refugee crisis". This study is mainly based on document studies in three countries. Further research is needed to explore the experiences of VET in other countries and to include the voices of the refugees themselves more directly.

References

Adams, D. (1993). Introduction. In D. Adams (Eds.), *Defining educational quality. Improving educational quality project* (pp. 3–24). University of Pittsburgh.

Andersen, O. D., & Kruse, K. (2016). *Vocational education and training in Europe – Denmark*. Cedefop ReferNet VET in Europe reports. https://www.kp.dk/wp-content/uploads/2020/02/vocational-education-and-training-in-europe-denmark.pdf

Arbeitsmarktservice. (2021, April). *The integration year*.

Arendt, J. N. (2018). *Sammenhængen mellem beskæftigelse og uddannelse for ikke-vestlige flygtninge og familiesammenførte* [The link between employment and education for non-western refugees and family members]. Rockwool Fondens Forskningsenhed. https://www.rockwoolfonden.dk/app/uploads/2018/06/Arbejdspapir-54-Sammenhængen-mellem-beskæftigelse-og-uddannelse.pdf

Arendt, J. N., & Bolvig, I. (2020). *Early labor market entry, language acquisition and labor market success of refugees*. VIVE. https://www.vive.dk/media/pure/15357/4639057

Aschauer, W., & Seymer, A. (2019). Zur sozialen Lage der Zugewanderten. Eine differenzierte Analyse der Bildungs- und Arbeitsmarktchancen [On the social situation of immigrants. A differentiated analysis of educational and labor market opportunities]. In W. Aschauer, M. Beham-Rabanser, O. Bodi-Fernandez, M. Haller & J. Muckenhuber (Eds.), *Die Lebenssituation von Migrantinnen und Migranten in Österreich. Ergebnisse einer Umfrage unter Zugewanderten* [The Living situation of immigrants in Austria. Results of a survey among immigrants] (pp. 23–58). Springer VS.

Asylkoordination Österreich. (n.d.). *Arbeitsmarktzugang* [Labor market access]. http://www.asyl.at/de/themen/arbeitsmarktzugang/

Baranik, L. E., Hurst, C. S., & Eby, L. T. (2018). The stigma of being a refugee: A mixed-method study of refugees' experiences of vocational stress. *Journal of Vocational Behavior*, *105*, 116–130. https://doi.org/10.1016/j.jvb.2017.09.006

Bartlett, L., & Vavrus, F. (2017). Comparative case studies: An innovative approach. *Nordic Journal of Comparative and International Education (NJCIE)*, *1*(1), 5–17. https://doi.org/10.7577/njcie.1929

Bauböck, R., & Tripkovic, M. (Eds.). (2017). *The integration of migrants and refugees. An EUI forum on migration, citizenship and demography*. European University Institute. https://doi.org/10.2870/30835

Becker, B., & Gretsch, C. (2016). Bildungsaspirationen in Familien mit Migrationshintergrund [Educational aspirations in families with a migration background]. In C. Diehl, C. Hunkler & C. Kristen (Eds.), *Ethnische Ungleichheiten im Bildungsverlauf: Mechanismen, Befunde, Debatten* [Ethnic inequalities in educational trajectories: Mechanisms, findings, debates] (pp. 73–115). Springer VS. https://doi.org/10.1007/978-3-658-04322-3

Beicht, U., & Walden, G. (2019a). Who dares win? Do higher realistic occupational aspirations improve the chances of migrants for access to dual vocational education and training in Germany? *Journal of Education and Work*, *32*(2), 115–134. https://doi.org/10.1080/13639080.2019.1617840

Beicht, U., & Walden, G. (2019b). Transition to company-based vocational training in Germany by young people from a migrant background – The influence of region of origin and generation status. *International Journal for Research in Vocational Education and Training*, *6*(1), 20–45. https://doi.org/10.13152/IJRVET.6.1.2

Bereday, G. (1964). *Comparative method in education*. Holt, Rinehart & Winston.

Bergseng, B., Degler, E., & Lüthi, S. (2019). *Unlocking the potential of migrants in Germany*. OECD Reviews of Vocational Education and Training. OECD Publishing. https://doi.org/10.1787/82ccc2a3-en

Bichl, N. (2017). Die aktuelle österreichische Anerkennungslandschaft [The current Austrian recognition landscape]. In M. Hammerer, E. Kanelutti-Chilas, G. Krötzl & I. Melter (Eds.), *Zukunftsfeld Bildungs- und Berufsberatung IV. Schwierige Zeiten – Positionierungen und Perspektiven* [Future field of educational and vocational guidance IV. Difficult times – Positioning and perspectives] (pp. 91–98). Bertelsmann. https://doi.org/10.3278/6004558w

Bolvig, I., & Arendt, J. N. (2018). *Nationale rammer for integrationsindsatsen for flygtninge 1997–2017* [National framework for integration measures for refugees 1997–2017]. VIVE. https://www.vive.dk/media/pure/10808/2302567

Bredgaard, T., & Ravn, T. L. (2018). Integration of refugees on the Danish labor market. *Nordic Journal of Working Life Studies*, *18*(S4), 7–26. https://doi.org/10.18291/njwls.v8iS4.111161

Brickner, I., & Krutzler, D. (2016, January 16). Ministerrat beschließt eines der schärfsten Asylgesetze Europas [Council of Ministers adopts one of Europe's toughest asylum laws]. *Der Standard*. https://www.derstandard.at/story/2000029831069/ministerrat-beschliesst-eines-der-schaerfsten-asylgesetze-europas

Bundesamt für Migration und Flüchtlinge. (2017a, October). *KompAS Kompetenzfeststellung, frühzeitige Aktivierung und Spracherwerb* [KompAS Competence assessment, early activation and language acquisition]. Anlage zum Trägerrundschreiben 10/2017. https://www.bamf.de/SharedDocs/Anlagen/DE/Integration/Integrationskurse/Kurstraeger/Traegerrundschreiben/2017/traeger-rundschreiben-10_20170626-anlage-01.pdf?__blob=publicationFile&v=5

Bundesamt für Migration und Flüchtlinge. (2017b, April). *Bericht zur Integrationskursgeschäftsstatistik für das Jahr 2016* [Report on integration course business statistics for the year 2016]. https://www.bamf.de/SharedDocs/Anlagen/DE/Statistik/Integrationskurszahlen/Bundesweit/2016-integrationskursgeschaeftsstatistik-gesamt_bund.pdf?__blob=publicationFile&v=2

Bundesinstitut für Berufsbildung. (2014). *Datenreport zum Berufsbildungsbericht 2014: Informationen und Analysen zur Entwicklung der beruflichen Bildung* [Data report on the vocational education and training report 2014: Information and analyses on the development of vocational education and training]. Bundesinstitut für Berufsbildung. https://www.bibb.de/dokumente/pdf/BIBB_Datenreport_2014.pdf

Bundesministerium für Bildung und Forschung. (2016, February). Übergangsstufe für Flüchtlinge [Transitional stage for refugees]. *Schule Mehrsprachig*. http://www.schule-mehrsprachig.at/index.php?id=365

Bundesministerium für Bildung und Forschung. (2020). *KAUSA: Jungen Flüchtlingen Chancen bieten* [KAUSA: Offering young refugees opportunities].

Busemeyer, M. R. (2014). *Skills and inequality: Partisan politics and the political economy of education reforms in western welfare states*. Cambridge University Press. https://doi.org/10.1017/CBO9781107477650

Busemeyer, M. R., & Trampusch, C. (2012). *The political economy of collective skill formation*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199599431.001.0001

Busse, R. (2020). *Übergangsverläufe am Ende der Sekundarstufe I. Erklärungsansätze für soziale und migrationsbezogene Ungleichheiten* [Transition pathways at the end of lower secondary education. Explanatory approaches for social and migration-related inequalities]. Wbv. https://doi.org/10.3278/6004818w

Cedefop. (2018). *The changing nature and role of vocational education and training in Europe responses*. Publications Office of the European Union. https://doi.org/10.2801/548024

Chadderton, C., & Edmonds, C. (2015). Refugees and access to vocational education and training across Europe: A case of protection of white privilege? *Journal of Vocational Education & Training*, *67*(2), 136–152. https://doi.org/10.1080/13636820.2014.922114

Choy, S., & Wärvik, G.-B. (2019). Integration of learning for refugee and migrant students: VET teachers' practices through practice theory lens. *Journal of Vocational Education & Training*, *71*(1), 87–107. https://doi.org/10.1080/13636820.2018.1518921

Danmarks Evalueringsinstitut. (2019). *Store kommunale forskelle i opkvalificeringen af flygtninge* [Large municipal differences in the upskilling of refugees]. https://www.eva.dk/sites/eva/files/2019-11/Notat%20-%20Store%20kommunale%20forskelle%20i%20opkvalificeringen%20af%20flygtninge_211119_Tilgængeliggjort.pdf

Danmarks Statistik. (2020). *Statistikbanken* [Statistical database]. https://www.statistikbanken.dk/

Der Paritätische Gesamtverband. (2017). *Handreichung – Der Zugang zur Berufsausbildung und zu den Leistungen der Ausbildungsförderung für junge Flüchtlinge und junge Neuzugewanderte* [Handbook – Access to vocational education and training and support services for young refugees and young new immigrants].

Dicks, A., Dronkers, J., & Levels, M. (2018). Cross-nationally comparative research on racial and ethnic skill disparities: Questions, findings, and pitfalls. In P. A. J. Stevens & A. G. Dworkin (Eds.), *The Palgrave handbook of race and ethnic inequalities in education* (pp. 1183–1215). Palgrave Macmillan. https://doi.org/10.1007/978-3-319-94724-2_27

Deutscher Industrie- und Handelskammertag. (2017). *Integration von Flüchtlingen in Ausbildung und Beschäftigung: Leitfaden für Unternehmen* [Integration of refugees in training and employment: Guideline for companies]. https://www.dihk.de/resource/blob/2410/629fa385fa9be8a73698cfe93020117f/integration-von-fluechtlingen-in-der-ausbildung-leitfaden-fuer-unternehmen-data.pdf

Eggenhofer-Rehart, P. M., Latzke, M., Pernkopf, K., Zellhofer, D., Mayrhofer, W., & Steyrer, J. (2018). Refugees' career capital welcome? Afghan and Syrian refugee job seekers in Austria. *Journal of Vocational Behavior*, *105*, 31–45. https://doi.org/10.1016/j.jvb.2018.01.004

Eurostat. (2019a). *Asylum statistics: Asylum applications (non-EU) in the EU-28 Member States, 2008–2018*. http://ec.europa.eu/eurostat/statistics-explained/index.php?title=Asylum_statistics

Eurostat. (2019b). *International migration statistics*. https://ec.europa.eu/knowledge4policy/dataset/ds00026_en

Federal Statistical Office. (2018, April 1). *Mikrozensus – Bevölkerung mit Migrationshintergrund* [Microcensus – Population with a migration background]. https://www.bpb.de/nachschlagen/zahlen-und-fakten/soziale-situation-in-deutschland/150599/migrationshintergrund-iii

Ferrari, R. (2015). Writing narrative style literature reviews. *The European Medical Writers Association*, *24*(4), 230–235. https://doi.org/10.1179/2047480615Z.000000000329

Graf, L., Lassnigg, L., & Powell, J. J. W. (2012). Austrian corporatism and institutional change in the relationship between apprenticeship training and school-based VET. In M. R. Busemeyer & C. Trampusch (Eds.), *The political economy of collective skill formation* (pp. 150–178). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199599431.003.0006

Granato, M., & Junggeburth, C. (2017). Geflüchtete in Deutschland – Rechtliche Rahmenbedingungen und soziodemografische Aspekte [Refugees in Germany – Legal Framework and Sociodemo-

graphic Aspects]. In M. Granato & F. Neises (Eds.), *Geflüchtete und berufliche Bildung* [Refugees and vocational education and training] (pp. 12–17). BIBB.

Granato, M., & Ulrich, J. G. (2013). Die Reformierbarkeit des Zugangs in duale Berufsausbildung im Spannungsfeld institutioneller Widersprüche [The reformability of access to dual vocational training in the context of institutional contradictions]. *Schweizerische Zeitschrift für Soziologie*, *39*(2), 315–339. http://doi.org/10.5169/seals-814998

Hautz, H., & Thoma, M. (2021). Teacher subjectivation in the quality dispositive: The example of VET in Austria. *British Journal of Sociology of Education*. https://doi.org/10.1080/01425692.2021.1908117

Heidenreich, M. (2016). Introduction: The double dualization of inequality in Europe. In Heidenreich, M. (Eds.), *Exploring Inequality in Europe* (pp. 1–21). Edward Elgar Publishing. https://doi.org/10.4337/9781783476664

Herzog-Punzenberger, B., & Schnell, P. (2012). Die Situation mehrsprachiger Schüler/innen im österreichischen Schulsystem – Problemlagen, Rahmenbedingungen und internationaler Vergleich [The situation of multilingual pupils in the Austrian school system – Problems, general conditions and international comparison]. In B. Herzog-Punzenberger (Ed.), *Nationaler Bildungsbericht Österreich 2012, Band 2: Fokussierte Analysen bildungspolitischer Schwerpunktthemen* [National education report Austria 2012, Volume 2: Focused analyses of educational policy key issues] (pp. 229–267). Leykam.

Hillmert, S. (2013). Links between immigration and social inequality in education: A comparison among five European countries. *Research in Social Stratification and Mobility*, *32*(1), 7–23. https://doi.org/10.1016/j.rssm.2013.02.002

Hippach-Schneider, U., & Huismann, A. (2019). *Vocational education and training in Europe: Germany*. Cedefop ReferNet VET in Europe reports 2018. https://www.cedefop.europa.eu/en/publications-and-resources/country-reports/vocational-education-and-training-europe-germany-2018

Hosner, R., Vana, I., & Khun Jush, G. (2017). *Integrationsmaßnahmen und Arbeitsmarkterfolg von Flüchtlingen und subsidiär Schutzberechtigen in Österreich* [Integration measures and labor market success of refugees and beneficiaries of subsidiary protection in Austria]. Forschungsbericht des FIMAS-Projekts [Research report of the FIMAS-Project]. International Centre for Migration Policy Development. https://www.zsi.at/en/object/project/4109

Huddleston, T., Bilgili, Ö., Joki, A.-L., & Vankova, Z. (2015). *Migrant integration policy index 2015*. CIDOB and MPG.

Hunkler, C., & Tjaden, J. D. (2018). Die Ausbildungsentscheidungen von Migranten im stratifizierten deutschen Bildungssystem: Zu optimistisch? [Migrants' educational choices in the stratified German education system: Too optimistic?] In E. Schilling (Eds.), *Verwaltete Biografen* [Managed biographees] (pp. 71–107). Springer Fachmedien.

Hupka-Brunner, S., & Kriesi, I. (2013). Ausbildungsbedingungen und Ausbildungszufriedenheit in der dualen Grundbildung: Die Rolle von Geschlecht und Migrationshintergrund [Training conditions and training satisfaction in dual basic education: The role of gender and migration background]. In A. Hadjar & S. Hupka-Brunner (Eds.), *Migrationshintergrund, Geschlecht und Bildungserfolg* [Migration background, gender and educational attainment] (pp. 242–269). Juventa.

Jackson, M., Jonsson, J. O., & Rudolphi, F. (2012). Ethnic inequality in choice-driven education systems: A longitudinal study of performance and choice in England and Sweden. *Sociology of Education*, *85*(2), 158–178. https://doi.org/10.1177%2F0038040711427311

Jeon, S. (2019). *Unlocking the potential of migrants: Cross-country analysis*. OECD Publishing. https://www.oecd-ilibrary.org/education/unlocking-the-potential-of-migrants_045be9b0-en

Kaufmann, S. (2016). *Wer Deutsch als Zweitsprache für Geflüchtete unterrichtet, muss dafür aus- und bzw. fortgebildet sein – und gut bezahlt werden*. [Those who teach German as a second language to refugees must be trained and well-paid]. http://www.deutsch-am-arbeitsplatz.de/fileadmin/user_upload/kaufmann_plädoyer.pdf

Kompetenzzentrum Fachkräftesicherung. (2020). *Willkommenslotsen* [Welcome guides]. https://www.kofa.de/dossiers/willkommenslotsen

Lessard-Phillips, L., Brinbaum, Y., & Heath, A. (2014). Academic and vocational tracking in upper secondary education. In A. Heath & Y. Brinbaum (Eds.), *Unequal Attainments: Ethnic Educational Inequalities in Ten Western Countries* (pp. 149–167). Oxford University Press. https://doi.org/10.5871/bacad/9780197265741.003.0005

Liebig, T., & Tronstad, K. R. (2018). Triple disadvantage? A first overview of the integration of refugee women. *OECD Social, Employment, and Migration Working Papers*, *216*, 1–37. https://www.oecd-ilibrary.org/employment/triple-disadvantage_3f3a9612-en

Mayring, P. (2014). *Qualitative content analysis: Theoretical foundation, basic procedures and software solution*. Beltz. http://nbn-resolving.de/urn:nbn:de:0168-ssoar-395173

Nielsen-Gravholt, S., & Jans, D. (2020). *Flygtninge i uddannelse* [Refugees in training]. Analyse & Tal. http://www.dsfnet.dk/wp-content/uploads/2020/03/Flygtninge-i-uddannelse_rapport_web.pdf

Nussbaum, M., & Sen, A. (1993). *The quality of life*. Clarendon Press. https://doi.org/10.1093/0198287976.001.0001

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). SAGE. https://doi.org/10.1002/nur.4770140111

Phillimore, J., & Goodson, L. (2006). Problem or opportunity? Asylum seekers, refugees, employment and social exclusion in deprived urban areas. *Urban Studies*, *43*(10), 1715–1736. https://doi.org/10.1080%2F00420980600838606

Pilz, M. (2018). Typologies to compare different VET systems: Purposes and a new approach. In L. M. Herrera, M. Teräs & P. Gougoulakis (Eds.), *Comparative Issues and Research Concerns in the National Landscapes of Vocational Education and Training* (pp. 21–51). Premiss.

Prakopchyk, Y. (2017). Bestehende Möglichkeiten der Flexibilisierung beruflicher Ausbildung [Existing possibilities for making vocational education and training more flexible]. In M. Granato & F. Neises (Eds.), *Geflüchtete und berufliche Bildung. Wissenschaftliche Diskussionspapiere* [Refugees and vocational education and training. Scientific discussion papers] (pp. 74–78). BIBB.

Preston, J., & Green, A. (2008). The role of vocational education and training in enhancing social inclusion and cohesion. In Cedefop (Eds.), *Impact of education and training: Fourth report on vocational training research in Europe* (pp. 121–193). Cedefop Publications Office.

Rabl, S. M., & Hautz, H. (2018). Jugendliche mit Fluchterfahrung in der beruflichen Bildung in Österreich – Status Quo und Herausforderungen [Young people with refugee experience in vocational education and training in Austria – Status quo and challenges]. *bwp@ Österreich Spezial: Wirtschaftspädagogische Forschung und Impulse für die Wirtschaftsdidaktik – Beiträge zum 12. Österreichischen Wirtschaftspädagogikkongress*. http://www.bwpat.de/wipaed-at1/rabl_hautz_wipaed-at_2018.pdf

Rambøll. (2018). *Evaluering af Integrationsgrunduddannelsen* [Evaluation of the basic integration programme] (IGU). Rambøll Management. https://integrationsbarometer.dk/tal-og-analyser/filer-tal-og-analyser/arkiv/evaluering-af-integrationsgrunduddannelsen

Schroeder, J., & Seukwa, L. H. (2017). Access to education in Germany. In A. Korntheuer, P. Pritchard & D. B. Maehler (Eds.), *Structural Context of Refugee Integration in Canada and Germany* (pp. 59–64). GESIS – Leibniz Institute for the Social Sciences. https://doi.org/10.21241/ssoar.52101

Seeber, S., Boschke, V., Busse, R., Geiser, P., Michaelis, C., Baethge-Kinsky, V., & Wiek, M. (2019). *Ländermonitor berufliche Bildung 2019. Ein Vergleich der Bundesländer mit vertiefender Analyse zu Passungsproblemen im dualen System* [States monitor 2019. A comparison of the federal states with an in-depth analysis of matching problems in the dual system]. Wbv. https://doi.org/10.3278/6004750w

SOS Mitmensch. (2017). *Nicht mehr schulpflichtige Asylsuchende: Zugang zu Bildung nicht garantiert. Recherche von SOS Mitmensch für den Zeitraum März bis Juni 2017*. [Asylum seekers no longer required to attend school: Access to education not guaranteed. Research by SOS Mitmensch for the period March to June 2017.]. https://www.sosmitmensch.at/dl/NlNmJKJKllmJqx4KJK/SOS_Mitmensch_Bildungszugang_Asylsuchende_Juni2017.pdf

Steiner, M. (2009). Early school leaving und Schulversagen im österreichischen Bildungssystem [Early school leaving and school failure in the Austrian education system]. In W. Specht (Ed.), *Nationaler Bildungsbericht Österreich 2009, Band 2 Fokussierte Analysen bildungspolitischer Schwerpunktthemen* [National education report Austria 2012, Volume 2: Focused analyses of educational policy key issues] (pp. 141–159). Leykam. http://dx.doi.org/10.17888/nbb2009-2

Thomassen, H. (2019). *The integration of refugees in Denmark*. https://op.europa.eu/en/publication-detail/-/publication/81826711-c7ac-11e9-9d01-01aa75ed71a1

Tjaden, J. D., & Scharenberg, K. (2017). Ethnic choice effects at the transition into upper-secondary education in Switzerland. *Acta Sociologica*, *60*(4), 309–324. https://doi.org/10.1177%2F0001699316679491

Webb, S., Hodge, S., Holford, J., Milana, M., & Waller, R. (2016). Refugee migration, lifelong education and forms of integration. *International Journal of Lifelong Education*, *35*(3), 213–215. https://doi.org/10.1080/02601370.2016.1208502

Werner, D. (2018). *Engagement von Unternehmen bei der Integration von Flüchtlingen. Herausforderungen und Erfolgsfaktoren* [Corporate engagement in the integration of refugees. Challenges and success factors]. Institut der deutschen Wirtschaft. https://kongress2018.bibb.de/wp-content/uploads/2018/06/forum_V_werner_tag_1_final_dok.pdf

Willems, K., & Vernimmen, J. (2018). The fundamental human right to education for refugees: Some legal remarks. *European Educational Research Journal*, *17*(2), 219–232. https://doi.org/10.1177%2F1474904117709386

Winther, E., Jordanoski, G., & Deutscher, V. K. (2018). Zum Umgang mit fehlenden formalen Qualifikationen [On dealing with a lack of formal qualifications]. *Unterrichtswissenschaft*, *46*(1), 7–20. https://doi.org/10.1007/s42010-018-0012-1

Wissenschaftliche Dienste des Bundestags. (2016). *Änderung des Asyl- und Aufenthaltsrechtes seit Januar 2015 mit den Schwerpunkten Asylpaket I und II* [Changes to the asylum and residence law since January 2015 with the focus on Asylum Package I and II]. Deutscher Bundestag. https://www.bundestag.de/resource/blob/424122/05b7770e5d14f459072c61c98ce01672/wd-3-018-16-pdf-data.pdf

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Programs' Efficacy to Develop Employable Skills for People With Functional Diversity: A Meta-Analysis

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Abstract

Purpose: Promoting the labour integration of people with functional diversity is a key element to achieve their social inclusion. This meta-analysis aims to examine the effectiveness of experimental programs in developing employable skills for people with disabilities.

Methods: Literature searches up to June 2019 were conducted in four databases (Web of Science, Scopus, PsycINFO and ERIC). Studies that met the following criteria were selected: (1) The program should develop employable skills; (2) the participants should be people with functional diversity; (3) the study should have a design with an experimental group and a control group as well as pretest and posttest measurements; (4) the study had to provide enough data to calculate the effect sizes; and (5) the study had to be written in English or Spanish. 67 independent studies met the selection criteria, among 14 articles published between 1998 and 2019.

Results: The results revealed mean effect sizes in favour of the experimental group for the set of all studies according to data reported by people with functional diversity, as well as according their relatives and teachers. The two dimensions of the programs with a significant effect size in favour of the experimental group were interview skills and career

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planning. Furthermore, it was found that the programs showed a higher degree of effectiveness in groups formed only by people with intellectual disabilities, with a lower educational level, whose duration ranged from six to twelve months. This was particularly the case with participants from Spain and Australia.

Conclusion: Promoting the labour insertion of people with disability is a key element to achieve their social inclusion. Programs that support and develop employability and that are conducted upon experimental conditions do have a positive impact upon young people with functional diversity. Upon the results, we discuss practical implications for integrating disabled persons into the labour market.

Keywords: Employability, Transition From Education and Training to Employment, People With Disability, Career Planning, Vocational Education and Training, VET

1 Introduction

Along history, the notion of disability and the legislation that addresses it have evolved and have conditioned the actions and support provided to people with functional diversity. This last concept, considered less offensive and more appropriate these days, refers specifically to people who perform certain functions differently than the average population so they are different than the statistical norm due to some reason (Senent-Ramos, 2020), even though many academic and policy documents use disability, like the Convention on the Rights of Persons with Disabilities (United Nations, 2006) or the European disability strategy 2010-2020 (European Union, 2010). In the past decades, there has been an evolution towards conceptual models that define disability in rather inclusive ways; a shift has been identified from a traditional individualist segregation model, where religious or magical explanations are provided, towards a social model based upon the relevance of personal autonomy (López-Bastías, 2019). This approach contributes to a practice that acknowledges the principle of equal opportunities, and this favors self-determination of people with disability. Accordingly, in recent years there has been an increase in actions and initiatives oriented towards diminishing inequalities that people with functional diversity face both in personal and professional domains. Nevertheless, despite the update of the notion of disability has implied a proliferation of legal and institutional measures regarding disability, these approaches are not exclusive and they are able to coexist in a given time, in such a way that inequalities remain.

According to the statistics of the United Nations, 82% of people with disability who live in developing countries are below poverty threshold (Martínez-Ríos, 2011). In Spain, according to the National Institute of Statistics (2019) employment rate among people with disabilities was 25.9% in 2017, while people without disabilities doubled that number, reaching 64.4%,

similarly to previous years. Therefore, restrictions in access to employment have implied an impulse for legal measures and other actions that attempt to reduce such inequalities.

The United Nations Convention on the Rights of People with Disabilities (United Nations, 2006) has established a new policy framework to strengthen their rights and liberties, whatever their condition. Furthermore, this organization suggested in 2015 the Agenda 2030, an action plan with the aim to achieve the world commitment in favor of people, the planet and prosperity. Among its aims, the acknowledgement and protection of rights of people with disabilities (Madans et al., 2017).

Nevertheless, despite progress regarding equal opportunities, no discrimination and universal accessibility of people with disabilities; there are yet huge differences in employment indexes of people with disabilities and the rest of the active population, as well as prejudice and discrimination in work relations (Goldman et al., 2006; Schur et al., 2009). There are also reports that show that recession and economic crisis have a negative impact upon this people, with increasing wage differences with people without disabilities (Eurofound, 2013; National Institute of Statistics, 2017) resulting in damages upon health and welfare.

Active participation in the labor market is one of the keys in quality of life of the population and this is also the case for people with functional diversity (Novo-Corti, 2018), and this is more the case in times of growing precariousness. Access to decent work is crucial in order to achieve social inclusion. Labor integration of people with functional diversity has been and is an aim of social policies and employment for international organizations and an increasing number of countries adopt them (Douvitsa, 2020; Fici, 2020; Maffiioletti & Sato, 2020; Meira, 2020; Salinas & Marhuenda, 2020). The social economy and Third Sector Organisations are playing a major role here (Bengoetxea & Fajardo, 2020; Marhuenda, 2021). This requires not only technical competence, but also social and personal abilities that allow workers to be employable or, in terms of Eraut (2004), to be competent in different domains or learning trajectories (job performance, role performance, working in teams, understanding and awareness or personal development among others). Findings about these possibilities with vulnerable groups have already been published (Chisvert et al., 2018; Marhuenda, 2018). In this sense, learning to work and becoming a worker are processes closely connected to becoming an adult and a citizen too, not just in individual terms, but also in societal ones; as it is the status of worker what provides acknowledgement for the status of citizen and of autonomous life, one free of dependency support provided by the administration, the families or volunteering practices.

In this regard, transition is a crucial dimension in our research, and it becomes the focus of our search question too: Transition programs are holistic as they intend to provide different supports (education, housing, health, counselling and leisure among them), as Casal (1996), Casal et al. (2015) and Merino (2007, 2019) have shown. Transition processes have become a stage of its own (Walther, 2006), beyond their instrumentality in getting a job, and it is in this context that employability gains relevance too: As a matter of fact, being employable

does not guarantee getting a job, but it is an indicator of readiness. Employability has been discussed in its relation to work and education (Gonon et al., 2008) as well as specifically focused upon people living in vulnerable circumstances (long term unemployed, people at risk of social exclusion, people with disabilities) in its individual and contextual features (Córdoba et al., 2013; Llinares et al., 2016). Transition programs try to foster employability rather than finding a job in themselves, and they do so by improving personal and social skills of the individuals, as well as their wellbeing along the process. This involves also addressing issues other than work-related ones (Hofmann et al., 2021). At this point, dealing with personal expectations, career guidance and planning, social skills to interact with other adults and self-confidence and self-knowledge are important dimensions in these programs. Therefore, occupational training is relevant, as well as the qualification level, but given limitations introduced by disabilities, the kind of disabilities have an impact upon expectations and ability to learn (Badiola et al., 2014; Elorriaga et al., 2019; International Labour Organization, 2016). Therefore, the kind of disability, educational background and duration of the program are dimensions that could have an impact upon intervention, as the country is also expected to do insofar there are specific policies, regulations and protective measures that have to be considered. Therefore, transition programs for vulnerable people often try to facilitate becoming an adult and an autonomous citizen, not just a worker: Nowadays, training for the labour market consists also of preparation for unemployment, even to increasingly precarious working conditions.

Much research has focused upon the study of transition into adult life of people with disability, without having the desired effect to improve social and labor inclusion (Dyke et al., 2013). Therefore, Pallisera et al. (2018) took the effort to identify, through focus groups with people with disabilities, their families and professionals in the fields of education and social work, the main obstacles that they face. Among these, the need to offer them a more flexible curriculum fostering their labor inclusion and the need to improve career guidance, particularly at the end of Secondary Education. It is therefore worth paying attention to training addressed to improve the employability of people with disability. Facilitating labor insertion of people with functional diversity through training opportunities, information and practice of personal, social and technical skills to have access into the world of work is crucial in this regard. Vocational education aimed at accredited qualification is key to equip youth with functional diversity to enter the labor market (Gilson et al., 2017).

Several systematic reviews have rigorously explained the 'state of the art' about this issue. Gilson et al. (2017) provided a systematic review through the analysis of 56 studies about different training methods for training employment skills among people with disabilities. They identified 21 such methods, among which four stranded out: Assessment of performance feedback, device-assisted instruction, response prompting and community-based instruction. Engelbrecht et al. (2017) reviewed 99 documents on transition programs into work for people with disabilities highlighting the need for further research. Several systematic reviews on peo-

ple with autistic spectrum disorder (ASD) pay attention to the features and results of actions based upon employment programs, transition into work and occupational activities (Hedley et al., 2017; Lee et al., 2018; Taylor et al., 2012; Walsh et al., 2017). Among these, Lee et al. (2018) point to practice within these employment programs focused not only in fostering occupational skills and improving employability results, but which also provide collateral benefits improving mental health, self-confidence or time-management, among others.

Despite systematic reviews show results indicating scientific standards, objectivity, systematization and replicability (Botella & Sánchez-Meca, 2015), it is not possible to draw conclusions based upon the measurement of effectiveness. In order to do so, meta-analytical studies allow to apply statistical techniques to integrate results in a set of empirical studies with the aim to establish the efficacy of certain programs and interventions.

Park et al. (2016) developed a meta-analysis with seven random controlled trials which analyzed the effect of training students with disabilities in social skills related to employment. Results pointed to a moderated effect size, and they found a larger effect in those studies applying direct instruction, particularly in cases with ASD, emotional or behavioral disorder and intellectual disability. Among the limitation of this research, they analyzed the isolated effect of social skills, without considering other relevant skills in access to the labor market. More recently, Alson et al. (2019), conducted a survey among managers and human resource officers, and they identified that the skills most demanded among people with disability are communication, teamwork, analysis and use of computer applications. Therefore, skills expected to be found among people with functional diversity when accessing employment are wider than mere social skills. Nonetheless, there have been no meta-analysis that analyze the effectiveness of employment programs considering skills in a wider sense.

Upon review of scientific literature, we have detected and increase in the number of studies conducted in recent years on access to employment of people with functional diversity. We are also conscious of the different measures taken to improve the awareness and engagement along the world to support the rights of people with disabilities. Nevertheless, employability indexes of people with functional diversity do not reach the expectations that neither programs nor research have cherished. Before this limitation, it seems adequate and timely to conduct a meta-analysis to allow identification of how effective prove employment programs for people with functional diversity and which are the conditions they embed that increase the success of such measures.

Therefore, our aim is to conduct a meta-analysis to assess the efficacy of employment programs addressed to young people with functional diversity. The research question we attempt to answer in our work is the following: What is the effectiveness of transition programs under experimental conditions that develop employability skills for young people with functional diversity; where effectiveness consists of a statistically significant larger size effect in the experimental groups in relation to the control groups.

2 Methods

2.1 Selection Criteria

Studies that met the following criteria were selected: (1) The program should develop employable skills; (2) the participants should be people with functional diversity; (3) the study should have a design with an experimental group and a control group as well as pretest and posttest measurements; (4) the study had to provide enough data to calculate the effect sizes; and (5) the study had to be written in English or Spanish.

2.2 Data Sources and Search Strategy

Studies were found using the Web of Science, SCOPUS, PsycINFO and ERIC databases for studies published in English or Spanish up to June 2019. The search strategy used was (program* or intervent* or train*) AND transition AND (employment or job or work) AND (disab* or autis*)[1]. No limitations in the search strategy were considered. In addition, other sources (e.g., google scholar and the references' list of the theoretical reviews) were used to rescue research that may not have been recovered from the afore mentioned databases.

Figure 1 presents the selection process followed by the PRISMA checklist. 3934 records were identified, of which 3048 did not simultaneously appear in all the databases used. From these studies, 2527 were excluded for not addressing the specified topic of research or for being written in languages such as Korean and Russian. Thus, 521 works were subject to the inclusion criteria, identifying a final sample of 14 studies that developed employable skills through programs for youth with functional diversity. The exhaustive reading of the articles allowed us to confirm the choice of all 14 papers given that they met all the inclusion criteria. Some of them included different measures of employable skills and other variables, so they were analyzed as independent meta-analyses. This study was developed in accordance with the PRISMA diagnostic test accuracy checklist that provides specific guidance for reporting of systematic reviews and meta-analysis (McInnes et al., 2018).

1 Following a reviewer's recommendation, we have checked in the four databases and stablishing the same time limit (June 2019, except in Scopus -through the year 2019-), to check whether including new keywords in the search strategy should lead us to include new articles in the meta-analysis because of meeting all the inclusion criteria. We tested the following search strategy (program* or intervent* or train*) AND transition AND (employment or job or work or employability or "employment skills") AND (disab* or autis* or "special needs") and the results found were: Web of Science 1667 results (207 more), Scopus 1000 results all the year 2019 (86 more), ERIC 1209 results (334 more) and PsycINFO 1399 results (720 more). Although the number of studies has increased, none of them meets the selection criteria reporting enough data to calculate the effect size and be implemented with an experimental group and a control group as well as offering pre-test and post-test measurements.

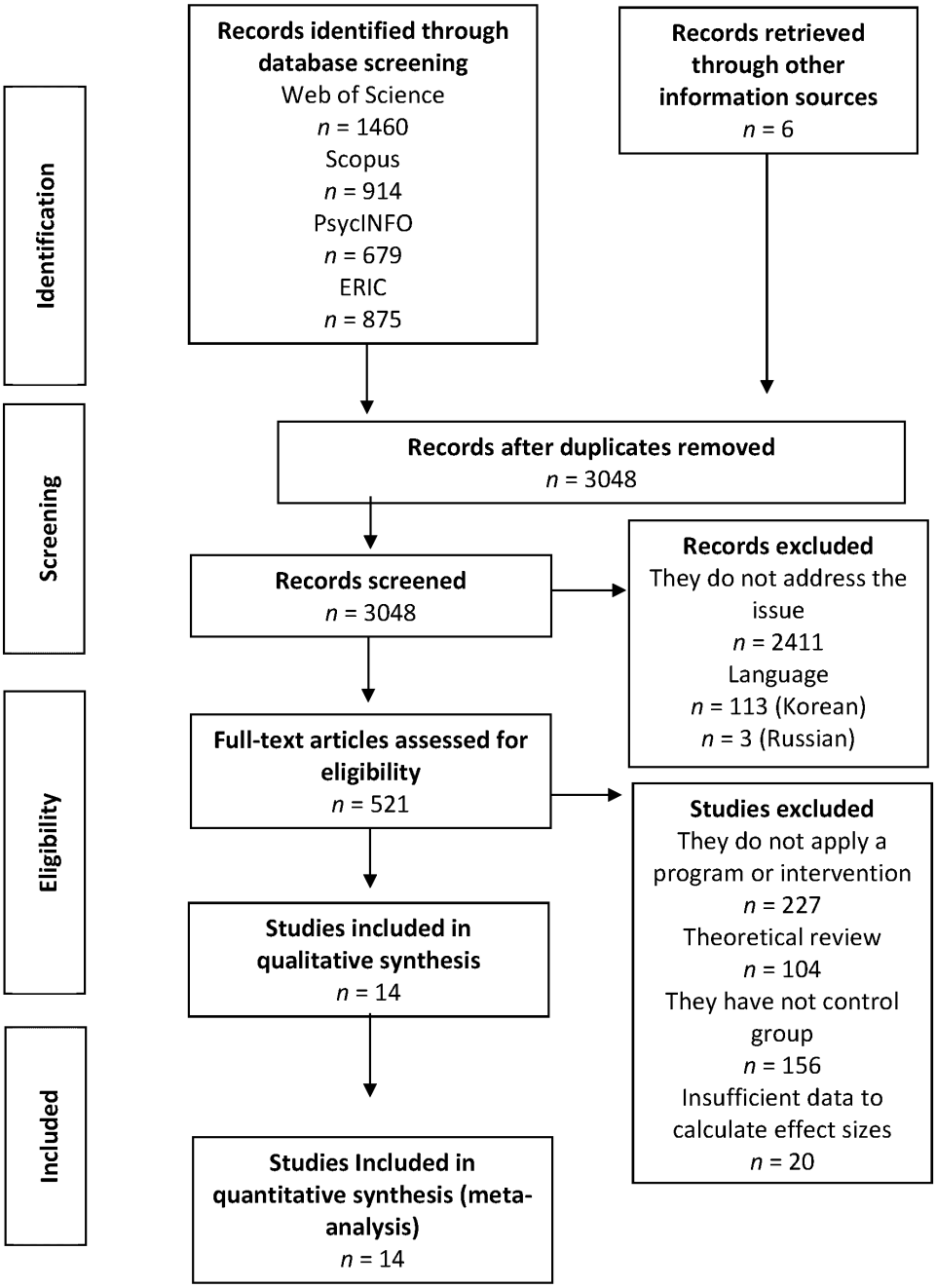


Figure 1: PRISMA Flow Diagram for Study Selection

2.3 Coding Moderator Variables

In order to analyze the heterogeneity between the results of the studies, the moderator variables that could be related with the effect sizes were coded. The moderator variables were classified according to Lipsey's classification (1994) as (a) participants' variables, that include personal characteristics of the samples (e.g. type of disability or disorder, the age range of the sample, the gender distribution, intelligence quotient); (b) treatment's variables, which are those that explain intervention characteristics (e.g. the magnitude of total duration, number of weekly hours of treatment (frequency), proportion of participants, use of the technology, teaching profile); (c) methodological characteristics, which have to do with the design of the research and the implementation of the empirical study (e.g. randomly group formation or not, type of control group (active versus non-active), number of participants in the control and experimental groups); and (d) extrinsic characteristics, which, in principle, should not relate to the scientific process, but that can be associated with the results (e.g. year of publication or country). The coding process was performed separately by two researchers in order to finally obtain a reliable and accurate code relationship.

2.4 Statistical Analyses

In this meta-analysis a random effect model was used. This statistical model is considered more appropriate because:

> *"Is more likely to fit the actual sampling distribution, does not impose a restriction of a common effect size, yields the identical results as the fixed-effect model in the absence of heterogeneity and allows the conclusions to be generalized to a wider array of situation." (Borenstein et al., 2010, p. 107)*

Typified mean change difference, d, was chosen as a measure of effect size (Glass et al., 1981). Positive values of d reflected an improvement from pretest to posttest in the treated group. The statistical analysis of the effect sizes was based on the model proposed by Hedges and Olkin (1985), according to which each effect size is weighted based on the inverse of its variance, so that studies with higher sample sizes exert a greater specific weight in these analyses. The mean efficacy was calculated and the heterogeneity was assessed using the *Q* test and the index I^2 (Higgins & Thompson, 2002). Statistical significance was set at $p<.05$ and significant heterogeneity was considered with the following values $p<.05$ and $I^2>50\%$. The heterogeneity will be explored through the influence of moderating variables. Statistical analyses were calculated with the RevMan5.3 program (2014).

3 Results

3.1 Descriptive Features of the Studies

Table 1 provides the descriptive features of the studies included in this meta-analysis. Fourteen studies met all inclusion criteria, among which 67 independent studies were identified, given that most of this research analyzed data from more than a variable upon different evaluation tools. Research was published between 1998 and 2019, 85.7% being published in the current decade.

Among features defining participants, age range varies between 12 and 55. Regarding sex, most of the studies entail mixed samples. Only one of the studies was conducted with only boys (Strickland et al., 2013) and there was also another study with only girls (Lindstrom et al., 2013). Seven out of the 14 reports were shaped by people with autistic spectrum disorder, one of them with people with intellectual disability, two in which participants had several difficulties and/or disabilities. Regarding intelligence quotient, while nine of the reports do not provide these data, in those which do so, most participants were above 70. Six of the reports do not inform about the educational background either, even though most of them point to a basic mastery of reading and writing competences (Fernández-Solano et al., 2019; Hatfield et al., 2017; Lindstrom et al., 2013; Smith et al., 2014), basic digital competences (Hatfield et al., 2017) or having successfully completed secondary education (Hayes et al., 2015; Oswald et al., 2017) and even post-compulsory and higher education (Mawhood et al., 1999). Nine reports were conducted in the United Sates, two of them in Spain, two in Australia and one in Japan. Only one of the reports provides evidence of previous work experience of participants (Ipsen et al., 2019). Two reports include other participants in the study, through the views of families (Hatfield et al., 2017; Powers et al., 2001) and two others take into account the views of teachers (Murray et al., 2013; Powers et al., 2001).

In terms of methodology, all research reports used a quasi-experimental design and the allocation of people to the experimental or control group was random except in three cases, two of them with non-random allocation (Lindstrom et al., 2013; Verdugo et al., 1998) and another one that does not specify this information (Mawhood & Howlin, 1999). Regarding the activity of the control group during the implementation of the program, most research proceed with the ordinary treatment of the group. Finally, several tools were used to assess the progress of participants, and the skills most evaluated were those related to emotional wellbeing, social skills, job expectations, skills for a job interview and career planning.

Regarding the features of the intervention programs, the length varies from 10 minutes per session with a total of five sessions (Kumakazi et al., 2017), to programs cuya lasting up to 24 months (Mawhood & Howlin, 1999). Most programs were applied individually or in small groups; while two of them combined individual and group treatment (Powers et al.,

2001; Verdugo et al., 1998). Five of the reports included the use of technologies, with online programs (Hatfield et al., 2017), mobile phones (Hayes et al., 2015; Strickland et al., 2013) or virtual reality (Kumakazi et al., 2017; Smith et al., 2014). Trainers were in most cases researchers supported by special education teachers, professional career guidance staff or human resource managers. Six of the reports indicate that trainers received specific training for the program (Lindstrom et al., 2013; Murray et al., 2013; O'Mally & Antonelli, 2016; Oswald et al., 2017; Powers et al., 2001; Smith et al., 2014) and three of the research teams included school teachers among them (Hatfield et al., 2017; Murray et al., 2013; Verdugo et al., 1998). All reports indicate a theoretical and practical approach except the one conducted by Mawhood and Howlin (1999) where only a practical approach is considered.

Table 1: Characteristics of the Studies Included in the Meta-Analysis – 1st Part

Authors (year)	Participants					Methodology		
	Age, gender and country	**Type of disability and IQ**	**Educational background**	**Professional training and previous labour experience**	**Other recipients**	**N experimental, N control and groups formation (random or not)**	**Activity in the control group**	**Instrument' name, type (self-report, interview, etc.) and specifically for people with disabilities**
Fernández-Solano et al. (2019)	18-36 Girls= 14 Boys= 11 Spain	Intellectual disability from mild to moderate	Basic skills such as writing, reading or calculation	They were enrolled in a job placement course	-	E= 12 C= 13 Random	Attended to lessons about vocational guidance	SF-36 Health Survey (Alonso et al., 1995). - Self-report. No Specific. Role Checklist (Colón & Haertlein, 2002). - Self-report. No Specific. Participants' personal journals. Focus groups.
Hatfield et al. (2017)	12-18 Girls= 19 Boys= 58 Australia	Autism Spectrum Disorder. Not intellectual disability	Basic computer skills and the ability to write at a year 5 reading level	-	Parents	E= 39 C= 38 A quasi-randomized controlled trial	Regular transition planning practice	AIR Self-Determination Scale (Wolman et al., 1994) - Self-report. No Specific. Career Development Inventory-Australia-Short Form (Thompson et al., 1981). - Self-report. No Specific. Personal Wellbeing Index (PWI-SC) (Cummins & Lau, 2005). - Self-report. No Specific. Learning Climate Questionnaire (LCQ, Williams &Deci, 1996). - Self-report. No Specific. Transition Planning Objectives Scale - Self-report. No Specific.

Ipsen et al. (2019)	14-16 Girls= 487 Boys= 941 USA	Learning disabilities and speech and language delays; 18.3%), personality and impulse control disorders (13.8%), autistic disorders (13.9%), intellectual disabilities (8.2%), and mood disorders (5.9%). -	-	Labour experience is assessed in both groups	-	E= 724 C= 704 Random	They receive the current services offered by their respective state transition and education systems	American Institutes for Research Self-Determination Scale (AIR-SDS) (Wolman et al., 1994). -Self-report. No Specific. Perceived Expectations Employment items -Self-report. No Specific. Adaptation from a single item on the Youth Risk Factor Surveillance System (YBFSS) (Centers for Disease Control and Prevention, 2018) -Self-report. No Specific.
Kumakazi et al. (2017)	18-25 Girls= 3 Boys= 12 Japan	Autism spectrum disorder Social anxiety No differences in IQ between both groups	-	-	-	E= 7 C= 8 Random	Read and answer materials about question collection for which was often asked in real job interview daily for a minimum of 10 min	Autism Spectrum Quotient-Japanese version (AQ-J) (Wakabayashi et al., 2004). - Self-report. Specific. Wechsler Intelligence Scale for Children-Fourth Edition or the Wechsler Adult Intelligence Scale-Third Edition. - Self-report. No Specific. Questionnaires scored on Likert rating scales of self-confidence in performance - Self-report. No Specific. Salivary cortisol after the human interviewer sessions and at the same time each day - Participants provided salivary. No Specific.

Lindstrom et al. (2013)	14-21 Girls= 110 Boys= 0 USA	Disabilities and other barriers- Learning disability (74%) Autism spectrum disorder (8%) Multiple disabilities (7%) Intellectual disability (5%) Other health impairment (2%) Visual impairment (2%) Hearing impairment (1%) Orthopedic impairment (1%).	Enrolled in high school	-	-	E= 68 C= 42 Not random	Control group received the typical transition services that were available in their high schools	PATHS survey - Self-report. No Specific. Two subscales from the Arc's Self-Determination Scale (Wehmeyer & Kelchner, 1995) - Self-report. No Specific. Subscales from the Student Engagement Inventory (Appleton et al., 2006) - Self-report. No Specific. Teacher Support Scale (Metheny et al., 2008) Vocational Skills Self- Efficacy Scale (VSSE; McWhirter et al., 2000) - Self-report. No Specific. The Career Outcome Expectancy Scale (COE; McWhirter et al. 2000). - Self-report. No Specific. Self-Advocacy subscale from the College Students with Disabilities Campus Climate survey (Lombardi et al., 2011) - Self-report. Specific. Seven focus groups
Mawhood et al. (1999)	18-55 Girls= 3 Boys= 47 United Kingdom	High functioning Autism or Asperger Spectrum Disorder. IQ 70 or above	Range from bachelor's degree or higher at university to special needs courses	-	Employers Support workers	E= 30 C= 20	-	Psychometric battery assessing: Cognitive and linguistic skills, academic attainments and social understanding. - Self-report. No Specific. Rosenberg Self-Esteem Inventory (Rosenberg, 1965) - Self-report. No Specific. A shorter battery (WAIS-R, British Picture Vocabulary Scales and Expressive One-Word Picture Vocabulary Test) - Self-report. No Specific.

Murray et al. (2013)	14-18 Girls= 87 Boys= 135 USA	Disability	-	-	Teachers	E= 122 C= 100 Random	Received "business-as-usual" within special education settings	Student report Vocational outcome expectations (VOCs) (McWhirter et al., 2000) - Self-report. No Specific. Social Skills Rating System (SSRS) (Gresham & Elliott, 1990) - Self-report. No Specific. Teacher report Occupational Skills subscale on the Adaptive Behavior Inventory (Brown & Leigh, 1986). Social Skills Rating System (Gresham & Elliott, 1990). Absences. Teacher-rated school engagement, Research Assessment Package for Schools (RAPS). Teacher coverage of the WAGES curriculum
O'Mally et al. (2016)	20-35 Girls= 32 Boys= 19 USA	Visual impairments	Participant should be within a year of graduation and seeking post-graduation employment.	-	-	E= 26 C= 25 Random	-	Job-Seeking Self Efficacy (JSSE) adapted from the JSSE scale for people with physical disabilities (Barlow et al., 2002). - Self-report. Specific. Assertive Job-Hunting Survey (AJHS) (Becker, 1980). - Self-report. No Specific. Career Adaptability Scale (CAS) adapted from the Career Futures Inventory (Rottinghaus et al., 2005) - Self-report. No Specific.

Oswald et al. (2017)	18-38 Girls= 13 Boys= 31 USA	Autism spectrum disorder. Verbal IQ ≥ 70	Completed high school, had spoken language and not exhibited evidence of psychosis or behavioral/ conduct problems	-	Each partici-pant selected a parent or close relative, referred to as "Social Coach", to participate in the concur-rent caregiver coaching group	E= 28 C= 16 Random	Control group received the ACCESS Program intervention 3 months after the two treatment groups had completed the program	Informant-Report Measures Adaptive Behavior Assessment System—Adult Form, Third Edition (ABAS-3) (Harrison & Oakland, 2015) - Self-report by Social coach. No Specific. Seven Component Self-Determination Skills Survey (Carter et al., 2013) - Self-report by Social coach. No Specific. Self-Report Measures Coping Self-Efficacy Scale (CSES) (Chesney et al., 2006) - Self-report. No Specific. ASEBA Adult Self-Report (ASR) (Achenbach & Rescorla, 2003) - Self-report. No Specific
Powers et al. (2001)	14-17 Girls= 13 Boys= 30 USA	Diverse disabilities	-	With regard to attendance at educational or transition planning meetings, 43% of the treatment group had attended their prior year's meeting while 41 % of the wait list group had attended their meeting.	-	E= 21 C= 22 Random	Control group would participate during the following semester	Educational Planning Assessment (EPA) (developed by this research) - Self-report. No Specific. The Transition Awareness Survey (Martin & Marshall, 1993) - Self-report. No Specific. The Family Empowerment Scale (Koren et al., 1992) - Self-report. Specific. Observational coding system evaluated student participation in transition planning meetings.

Smith et al. (2014)	18-31 Girls= 5 Boys= 21 USA	Autism spectrum disorder	(1) have at least a 6th grade reading level	-	-	E= 16 C= 10 Random	Treatment as usual	Repeatable battery for the assessment of neuropsychological status (RBANS) (Randolph et al., 1998) Bell–Lysaker emotion recognition task (BLERT) (Bell et al., 1997)
Strickland et al. (2013)	16-19 Girls= 0 Boys= 22 USA	High functioning Autism Spectrum Disorders and Asperger's Disorder. Not intellectual disability		-	-	E= 11 C= 11 Random	None	Interview skills rating instruments - A human resources professional completed the rating scales based on participant. No Specific. Social responsiveness scale (Constantino & Gruber, 2005). - A human resource professional completed the rating scales based on participant performance. - It allows the quantification of symptomatology associated with ASD.
Verdugo et al. (1998)	18-45 Girls= 35 Boys= 49 Spain	Physical disabilities and deafness	They are studying in a professional rehabilitation center	Students of fields related to office work, artistic fields and the practical activities	-	E= 56 C= 28 Not random	-	My Vocational Situation, (Holland et al., 1980). - Self-report. No Specific. The Employability Maturity Interview, EMI; (Morelock et al., 1987) - Self-report. No Specific. Vocational Self-Awareness, (Farley, 1988) - Self-report. No Specific. Self-Image questionnaire Revised, OSIQR, (Offer et al., 1992). - Self-report. No Specific.

Hayes et al. (2015)	17-18 Girls= 2 Boys= 13 USA	Autism Spectrum Disorders	Senior year of high school or had graduated high school	Receiving services from the transition program	-	E= 8 C= 7 Random	None	A rubric Researchers transcribed the research interviews for qualitative analysis

Note. IQ= Intelligence Quotient

Table 1: Characteristics of the Studies Included in the Meta-Analysis – 2nd Part

Authors (year)	**Intervention**								
	Name of the program or intervention	Duration	Proportion	Use of technology	Teaching profile			Procedure	Assessment
		Frequency and total	N / group intervention	Used or not Type Access	Background education	Knowledge in research topic	Relationship with participants	Theory and/or Practice	Process or final
Fernández-Solano et al. (2019)	Occupational Self-Analysis Programme. An adaptation of the 'Age Doing' programme (Rodríguez-Bailón et al. 2016)	90 minutes/week 9 months	Group	Not used	-	-	-	Theory and/or Practice	Initial and final
Hatfield et al. (2017)	Better OutcOmes & Successful Transitions for Autism (BOOST-A™)	- 12 months	Individually	Used Online program Closed Individual login	-	-	School staff	Theory and practice	Initial and final

Ipsen et al. (2019)	Achieving Success by Promoting Readiness for Education and Employment (ASPIRE) consortium, one of the six PROMISE sites.	- 12 months 24 months	Individually	Not used	Vocational Rehabilitation counselor	-	-	Theory and practice	Initial, 12 months later and 24 months later
Kumakazi et al. (2017)	Android Robot-Mediated Mock Job Interview Sessions	10 minutes/day 5 days	Individually	Used Android robot	-	-	-	Theory and practice	Initial and final
Lindstrom et al. (2013)	Postschool Achievement Through Higher Skills - PATHS	50-minute class 77 lessons 18-week semester	Small groups	Not used	-	All PATHS instructors attended an initial 1.5-day workshop, followed by three 2-hour training sessions throughout the 18-week implementation period	No relationship	Theory and practice	Initial and final
Mawhood et al. (1999)	Supported employment project for high-functioning adults with autism	- Range from 5 to 24 months	Individually in a company	Not used	-	-	Support worker	Practice	Initial and final
Murray et al. (2013)	Working at Gaining Employment Skills (WAGES)	3 and 4 days per week Approx. 4.5 months (January-May)	Activities that encourage students to participate cooperatively	Not used	Special education teachers, vocational rehabilitation counsellors, or other school personnel	All teachers were provided a free copy of the WAGES curriculum and participated in a paid (US$35 per hour) 2-day training about WAGES	Their teachers	Theory and practice	Initial and final

O'Mally et al. (2016)	Career Mentoring on Employment Outcomes	- 1 year	-	Not used	Mentors included those who were currently employed or recently retired, legally blind, and living in the United States	Employment mentoring manual A 20-page manual in electronic format to students and their mentors	-	Theory and practice	Initial and final
Oswald et al. (2017)	Acquiring Career, Coping, Executive control, Social Skills (ACCESS) Program	1 hour and a half 19 sessions	Small groups	Not used	The supervisor was a licensed psychologist.The Participant Group leader, the Social Coach Group leader and the co-facilitators have advanced studies and prior experience working with these people.	Yes	-	Theory and/or Practice	Initial and final
Powers et al. (2001)	TAKE CHARGE For the Future	The intervention (a) individual, 50 minute bi-weekly coaching sessions for youths, (b) monthly community-based workshops, (c) community activities, (d) telephone and home visit support for parents, and (e) in-service education for transition staff 4 months	Individually and small groups	Not used	The team included an experienced secondary educator, a parent support staff person, and a peer counselor from the community independent living program.	The research teams participated in a three-day training program	Research teams	Theory and/or Practice	Initial and final

Smith et al. (2014)	Virtual reality job interview training	5 sessions of 2 hours 2 weeks	Individually	Used Virtual reality Closed	-	Two research staff members were trained to administer the intervention using a checklist devised by the scientific team	-	Theory and practice	Initial and final
Strickland et al. (2013)	JobTIPS employment program	-	Individually	Used Online program Closed	Human resources professional	-	-	Theory and practice	Initial and final
Verdugo et al. (1998)	Program of vocational evaluation and guidance	18 sessions of 1 hour and a half 27 hours	Individually and groups	Not used	Teachers, the signed language teacher and other volunteers	-	Teachers from the center and other volunteers	Theory and practice	Initial and final
Hayes et al. (2015)	VidCoach	- 1 month	Individually	Used Mobile video modelling and prompting application Closed	-	-	-	Theory and practice	Initial and final

3.2 Mean Effect Size and Heterogeneity Analysis

Table 2 provides the effect size and the statistics of heterogeneity of the meta-analysis conducted. First, we analyzed the medium effect of the group of all studies upon data provided by people with functional diversity. Second, we included two independent meta-analysis taking into consideration results provided by relatives and teachers respectively. Third, we conducted five meta-analysis upon skills most often developed in these programs and for which we had results in at least five studies. These consisted of interview, career planning, emotional welfare, social skills and job expectations.

The effectiveness of treatment was measured through the effect size. For the group of all studies, the average effect size was a value of .38, which indicates that programs that develop labor skills for people with functional diversity proved effective for the experimental group. Accordingly, results provided by relatives and teachers revealed values of global average effect size of .43 and .53 respectively in favor of the experimental group. These effect sizes proved of low magnitude for the group of all reports and the viewpoint of relatives, while the magnitude proved moderate for the case of teachers.

Regarding the areas promoted by the programs, an average effect size in favor of the experimental group was found in interview skills, career planning and job expectations. The magnitude of effect was moderate for career planning (d= .66) and low for interview skills (d= .42), while it did not achieve a practical relevance in terms of job expectations (d= .09).

The average global effect for all studies showed a moderate magnitude of variability (I^2= 74%), as well as for the area of career planning (I^2= 68%). Furthermore, the degree of heterogeneity was also moderate when the relatives reported (I^2= 68%), while it was high in the case of teachers (I^2= 87%).

If the homogeneity test proves significative and the index I^2 indicates heterogeneity in the size effect, it is convenient to conduct analysis of possible moderating variables that explain the heterogeneity. These analyses were conducted only on the set of all studies (k= 67 studies), not being applied to data on the different areas nor those reported by relatives (k= 9 studies) nor teachers (k= 5 studies) due to the reduced numbers within these categories.

Table 2: Effect Size and Analysis of Heterogeneity in the Posttest

	k	*d*	95% CI		*Q*	*df*	Test for overall	I^2
			d_l	d_u			effect (*z*,*p*)	
Global effect	67	.38	.28	.48	258.09	66	7.45, <.001	74%
Family	9	.43	.16	.69	25.22	8	3.17, <.05	68%
Teachers	5	.53	.14	.92	38.03	4	3.88, <.05	87%
Interview skills	13	.42	.10	.75	19.03	12	2.53, <.05	37%
Career planning	8	.66	.34	.98	22.02	7	4.03, <.001	68%
Emotional welfare	6	.22	-.14	.59	10.24	5	1.21, .23	51%
Social skills	6	.30	-.06	.65	21.94	5	1.65, .10	77%
Labor expectations	5	.09	.01	.17	4.73	4	2.20, <.05	15%

Note. *k*= number of studies, *d*= mean effect size, CI= confidence interval, d_l and *du*= lower and upper confidential limits of the 95% confidence interval around the mean effect size, *Q*= homogeneity test, *df*= degrees of freedom of *Q* statistic, I^2= heterogeneity index

3.3 Analysis of Moderating Variables

The analysis of moderating variables was applied to the set of studies with data reported by people with functional diversity. Thirteen variables were tested, which are classified in participants' variables (age of participants, type of disability, educational background, other participants in the study, training of the instructors, relation of the participants with the instructors), treatment's variables (length of the program, use of technologies, type of technologies), methodological characteristics (type of allocation to control/experimental group, type of grouping for the intervention) and extrinsic characteristics (publication year, country). The inter-category homogeneity statistic was significant for the variables type of disability, educational background, length and country.

Regarding participant's variables the type of disability and educational background were significant moderating variables. With regard to the type of disability, we compared the efficacy of treatments by differentiating four groups according to the type of disability or disorder of participants in the programs: (1) Autistic spectrum disorder, (2) intellectual disability, (3) physical or sensory disability and (4) several disabilities or disorders in the same group and program. The results revealed statistically significant differences between the four groups (Q_b= 10.68, p = .01), reaching a larger effect size of intervention when groups were shaped by people with intellectual disability (*d*= .84; 95% IC: .38 and 1.31) before the remaining types whose impact was lower, despite also significative.

Regarding educational background, we distinguished two groups (1) basic educational level or young people enrolled in secondary education and (2) intermediate educational background with a degree in secondary education or higher education studies. We obtained

statistically significative differences between groups (Q_b = 6.07; p = .01), where the group with lower educational background achieved a larger effect size (d= .62; 95% IC: .36 and .88).

Regarding treatment's variables, the length of the programs was a significant moderating variable. We distinguished four groups (1) less than 10 sessions or shorter than a month, (2) 11 to 20 sessions or between two to five months, (3) six to twelve months and (4) beyond a year. Statistically significative differences resulted among the average effects of the groups (Q_b = 7.20; p = .03), where programs between six and twelve months (d = .68; 95% IC: .34 and 1.01) proved more effective than shorter and longer ones.

Finally, regarding the extrinsic characteristics, some words about the four countries in the studies (1) United States of America, (2) Spain, (3) Australia and (4) Japan; results revealed statistically significative differences among the groups (Q_b = 8.50; p = .04), where Spanish studies (d = .58; 95% IC: .36 and .80) and Australian ones (d = .55; 95% IC: -.08 and 1.17) obtained a larger impact in comparison to the USA and Japan.

Table 3: Moderating Variables

Moderating variables				IC 95%		Results
		k	***d***	d_l	d_u	
Type of disability	ASD	28	.35	.09	.61	*Q_b = 10.68, p = .01*
	Intellectual disability	10	.84	.38	1.31	*I^2 = 71.9%*
	Physical o sensory disability	12	.45	.28	.61	
	Several	17	.21	.10	.32	
Educational	Basic or high school skills	25	.62	.36	.88	*Q_b = 6.07; p = .01*
background	Secondary completed or higher	16	.22	.03	.41	*I^2= 83.5%*
Duration	Less than 10 sessions or up to 1 month	13	.22	-.04	.47	*Q_b = 7.20; p = .03*
	Between 11-20 sessions or 2-5 months	26	.38	.23	.52	*I^2= 72.2%*
	Between 6-12 months	20	.68	.34	1.01	
	More than a year	6	.05	.00	.10	
Country	USA	38	.26	.16	.36	*Q_b = 8.50; p = .04*
	Spain	19	.58	.36	.80	*I^2 = 64.7%*
	Australia	7	.55	-.08	1.17	
	Japan	2	-.11	-.83	.62	

Note. ASD = Autism Spectrum Disorder, k = number of studies, d = mean effect size. d_l and d_u= lower and upper confidential limits of the 95% confidence interval around the mean effect size, Q_b = inter-category homogeneity statistic, I^2 = heterogeneity index

4 Discussion

The issue we have addressed in this paper is currently being discussed by the academy, and 85.7% of the articles reviewed have been published in the last decade. The fact that such research is addressed by the scientific community is also an indicator of the growing weight of fostering employability among people with disabilities in order to facilitate their access into the labor market, as one more dimension having an impact upon social inclusion: There is enough employability appraisal nowadays to allow for research to be conducted in the field. That being the context for our research question, we can now discuss our results.

First, we can state that programs have a positive effect upon the experimental groups as we can see in tables 2 and 3 Results obtained from the views of relatives as teachers provide a statistically significant mean effect in favor of the experimental group. Furthermore, if we take into account the skills developed in the different programs, we identified a mean effect size in favor of the experimental group in the areas of career planning, interview skills and professional expectations; while no significative effect was found in comparison with the results of the control group for dimensions such as emotional welfare or social skills. Effect sizes we found vary from small magnitudes for all of the reports, family perception and interview skills, to a moderating magnitude for the perception of teachers and career planning. We did not find any large magnitude.

Nevertheless, we must consider that the struggle for social inclusion in the field of disabilities has been a history of small yet steady advances, rather than sudden improvements nor high-impact solutions (López-Bastías, 2019). If we look back thirty years, work integration of people with disabilities was not even an expectation, and we are now discussing not just training for an occupation but even development of employability skills, the focus of our review. This is a step beyond occupational training, as employability embeds social and personal skills that are useful both in work and in everyday life domains (Llinares et al., 2020a).

Second, we have to consider the assessment of teachers and trainers, who share a higher perception of the impact of the programs under review. This is relevant for the fact that teachers and trainers are able to compare and contrast among people who have taken part in the experimental programs and those who have not, but also for they are able to compare among these people ready to improve their employability and others with similar handicaps whose employability is lower and therefore not appropriate to consider further preparation for integration in the labor market. Given that employability can be measured (most employability assessment tools synthetize achievement in terms of grades), the perception and evaluation of teachers becomes even more relevant; as families and people with disabilities themselves do not have that comparative context. Teachers have specific training, they are aware of labor market conditions, they know the results of integration into the labor market of former cohorts of people attending their programs, and they can assess people's employability with less personal engagement and larger group reference.

If we move now in the specific detail regarding dimensions, our results do not match the previous study upon social skills (Park et al., 2016), as we have not found significative impact in this domain. We suggest different explanations for this result: First, our study has focused not only upon this dimension, and once we have conducted a broader search, we may have missed some study. This is however a common limitation in meta-analysis studies known as selection and publication bias (Sandoya, 2008) despite our methodological approach is robust enough, as we have detailed above. However, social skills are not only trained for employability purposes, and they can also be part of other integration and training programs (Bundock & Hewitt, 2017).

Furthermore, social skills have the opportunity to be developed in most everyday activities also out of training programs, this being an issue that cannot be measured under experimental conditions: The more participation a person has in ordinary life in society, the more chances to develop and improve social skills. In fact, there is literature on employability that considers the advantages of developing social skills out of specific training measures (Ibáñez & Mudarra, 2005).

Anyhow, the effect size has resulted significatively positive in favor of the experimental group in the domains that can be linked to a greater extent to work, such as career planning, interview skills and labor expectations. This is relevant for these are issues that, in contrast to general social skills, are labor-specific and are part, as such, of any vocational education and training program also for all kinds of people as well as for all levels of qualification (Hedley et al., 2017; Jordan et al., 2016; Lee et al., 2018; Walsh et al., 2017). These are crucial in the preparation for employment and therefore these results are particularly relevant in our study, as they do not deal just with social inclusion but directly with integration into the labor market.

In summary, these results contribute to encourage the research community (and practitioners in first place) to keep working in other dimensions surrounding employability such as the emotional wellbeing and overall health, as these constitute the basis to strengthen the impact of all other variables (Cavadel et al., 2017; Llinares et al., 2020a, 2020b).

Regarding the moderating variables, we found that four of the 13 variables analyzed had a positive impact upon the effectiveness of the interventions: Where the participants have a lower educational level and intellectual disability (participants moderating variables); where the duration of the programs is between 6 and 12 months (treatment moderating variable); and those from Spain or Australia (extrinsic moderating variable). It becomes evident that participant variables, treatment variables and extrinsic characteristics do play a role, while methodological features do not.

Lower educational level has a direct impact not only upon career expectations, but also upon the qualification level to which one can prepare and, therefore, it introduces serious limitations in prospective employments which are less demanding not only in terms of occupational skills but also of employability skills.

Intellectual disability is well studied, it is different to mental illness and subject to medical measurement that indicates degrees of impairment that have an impact upon job choices, which is sometimes twofold: They can be obstacles to find proper jobs, though there are companies that sometimes search for candidates with certain percentage of disability as this provides social security and fiscal benefits for the company.

Duration of the training programs makes a difference as the impact of short-term programs upon long-term issues like career planning, career expectations and chances to engage in the job-search process, that are not as frequent as desirable and are also subject to labor market chances, as we have stated just above.

The country effect can be weighed by two different conditions: First, the cultural consideration that functional diversity has among the population and the overall awareness of inclusion rights and practices. This will be consequently reflected in employment and employability policies. Second, the productive fabric of the different countries indicates different labor market structures as well as labor relations which are also directly related to the chances to hire people with functional diversity.

At this point, some limitations of this meta-analysis should be mentioned. As in this study, most conventional meta-analytic procedures assume independence among the effect sizes (Cheung, 2014, 2019). The homogenization of the results was carried out by applying the index of effect size typified mean change difference. Homogeneous and comparable quantitative index independently of the different tests used in the different studies, interpreting them as typical units of separation between the means of the two groups (Sánchez-Meca & Botella, 2010). However, averaging the effect sizes or selecting one effect size per study may lead to missed opportunities to utilize all available data. In order to overcome this limitation, multivariate meta-analysis and three-level meta-analysis have been proposed as a future research line to handle non-independent effect sizes (Cheung, 2019). Another limitation was the scarce number of studies that fulfilled the selection criteria. Consequently, results need to be interpreted with caution pending the publication of new studies in this field.

Finally, we would like to focus upon the social and educational implications of the meta-analysis we have conducted. First, without doubt, more experimental research is needed in order to contrast the results showed so far. Furthermore, it would be advisable to produce research that is applied to people with similar handicaps in different countries, something which is possible particularly in short-term training programs, and several of them were mentioned in our study. Second, this is also possible in relation to certain disabilities which, in a way, contribute to homogenize the population and therefore the groups of people that attend such training interventions, allowing for more experimental design than research upon training programs in other domains where there is much wider variability of conditions that may have an impact upon the effects of vocational or employability programs. Third, long-term training programs are advisable if we want to strengthen issues like career planning

and the development of vocational expectations and identities, as these are dimensions that demand educational rather than training interventions.

Programs that support and develop employability and that are conducted upon experimental conditions do have a positive impact upon young people with functional diversity, and this is a promising result in relation to the expansion of such programs in order to facilitate their access into the labor market and hence more and better chances for social inclusion and participation as adult citizens.

Our contribution has intended to advance knowledge in this terrain, and it has also allowed us to identify the scarcity of programs and of experimental research in an area in which, due to the medical diagnostic behind several disabilities, they might apply better than in other circumstances surrounding vulnerable transitions, such as those caused by social instead of biological factors.

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References[2]

Achenbach, T. M., & Rescorla, L. (2003). *Manual for the ASEBA adult forms & profiles*. University of Vermont, Research Center for Children, Youth, and Families.

Alonso, J., Prieto, L., & Antó, J. M. (1995). La versión española del SF-36 health survey (Cuestionario de Salud SF-36): Un instrumento para la medida de los resultados clínicos. *Medicina Clínica*, *104*(20), 771–776.

Alson, J. N., Espela, C. S., & Urbina, M. A. C. O. (2019). Factors affecting employability of persons with disabilities. *International Journal of Multidisciplinary Research and Publications*, *1*(9), 1–5.

Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2006). Measuring cognitive and psychological engagement: Validation of the student engagement instrument. *Journal of School Psychology*, *44*(5), 427–445. https://doi.org/10.1016/j.jsp.2006.04.002

Badiola, V., Barroso, J., Cornejo, I., De La Serna, F., Elorriaga, E., Etxebarria, J., Franco, T., Igeregi, I., Iturbide, P., Martín, F., Martín, M., Martínez, F. J., Mata, B., Mercado, A., Molinos, A., Navarro, S.,

2 References preceded by an asterisk were included in the meta-analysis.

Restrepo, W., Santamaría, T., & Zulueta, B. (2014). *Método de Perfiles LantegiBatuak de adecuación de la tarea a la persona*. Lantegi Batuak Fundazioa.

Barlow, J., Wright, C., & Cullen, L. (2002). A job-seeking self-efficacy scale for people with physical disabilities: Preliminary development and psychometric testing. *British Journal of Guidance & Counseling*, *30*(1), 37–53. https://doi.org/10.1080/030698880220106500

Becker, H. A. (1980). The assertive job-hunting survey. *Measurement and Evaluation in Guidance*, *13*(1), 43–48. https://doi.org/10.1080/00256307.1980.12022216.

Bell, M., Bryson, G., & Lysaker, P. (1997). Positive and negative affect recognition in schizophrenia: A comparison with substance abuse and normal control subjects. *Psychiatry Research*, *73*, 73–82. https://doi.org/10.1016/s0165-1781(97)00111-x

Bengoetxea, A., & Fajardo, G. (2020). La inclusión socio-laboral de colectivos vulnerables en las empresas de economía social. *CIRIEC-España, Revista Jurídica de Economía Social y Cooperativa*, *36*, 9–12.

Borenstein, M., Hedges, L.V., Higgins, J. P. T., & Rothstein, H. R. (2010). A basic introduction to fixed-effect and random-effects models for meta-analysis. *Research Synthesis Methods*, *1*, 97–111. https://doi.org/10.1002/jrsm.12

Botella, J., & Sánchez-Meca, J. (2015). Meta-análisis en ciencias sociales y de la salud. Síntesis.

Brown, L., & Leigh, J. E. (1986). *Adaptive Behavior Inventory*. Pro-Ed.

Bundock, K. E., & Hewitt, O. (2017). A review of social skills interventions for adults with autism and intellectual disability. *Tizard Learning Disability Review*, *22*(3), 148–158. https://doi.org/10.1108/TLDR-05-2016-0015

Carter, E. W., Lane, K. L., Cooney, M., Weir, K., Moss, C. K., & Machalicek, W. (2013). Self-determination among transition-age youth with autism or intellectual disability: Parent perspectives. *Research and Practice for Persons with Severe Disabilities*, *38*(3), 129–138. https://doi.org/10.1177/154079691303800301

Casal, J. (1996). Modos emergentes de transición a la vida adulta en el umbral del siglo XXI: Aproximación sucesiva, precariedad y desestructuración. *Revista española de investigaciones sociológicas*, *75*, 295–318.

Casal, J., García, M., & Merino, R. (2015). Pasado, presente y future de los estudios sobre las transiciones de los jóvenes. *Revista de Estudios de Juventud*, *110*, 69–81.

Cavadel, E. W., Kauff, J. F., Anderson, M. A., McConnell, S., & Derr, M. (2017). *Self-regulation and goal attainment: A new perspective for employment programs*. Office of Planning, Research, and Evaluation, Administration for Children and Families U.S. Department of Health and Human Services.

Centers for Disease Control and Prevention. (CDC) (2018). *YRBSS – Youth risk behavior surveillance system: Data – Adolescent and school health*. https://www.cdc.gov/healthyyouth/data/yrbs/index.htm

Chesney, M. A., Neilands, T. B., Chambers, D. B., Taylor, J. M., & Folkman, S. (2006). A validity and reliability study of the coping self-efficacy scale. *British Journal of Health Psychology*, *11*(3), 421–437. https://doi.org/10.1348/135910705X53155

Cheung, M. W.-L. (2014). Modeling dependent effect sizes with three-level meta-analyses: A structural equation modeling approach. *Psychological Methods*, *19*(2), 211–229. https://doi.org/10.1037/a0032968

Cheung, M. W.-L. (2019). A guide to conducting a meta-analysis with non-independent effect sizes. *Neuropsychology Review*, *29*, 387–396. https://doi.org/10.1007/s11065-019-09415-6

Chisvert, M. J., Palomares, D., Hernáiz, N., & Salinas, M. (2018). Trayectorias de aprendizaje en contextos informales. El caso de tres empresas de inserción. *Ciriec*, *94*, 185–216. http://ciriec-revistaeconomia.es/wp-content/uploads/CIRIEC_9407_Chisvert_et_al.pdf

Colón, H., & Haertlein, C. (2002). Spanish translation of the role checklist. *American Journal of Occupational Therapy*, *56*(5), 586–589. https://doi.org/10.5014/ajot.56.5.586

Constantino, J. N., & Gruber, C. P. (2005). *Social responsiveness scale (SRS)*. Western Psychological Services.

Córdoba, A., Llinares, L., & Zacarés, J. J. (2013). Employability assessment in vocational education and transition to the workplace. In J. Seifried & E. Wuttke (Eds.), *Transitions in vocational education, research in vocational education* (pp. 181–200). Budrich.

Cummins, R., & Lau, A. (2005). *Personal wellbeing index-school children (PWI-SC) (3rd ed.)*. Deakin University.

Douvitsa, I. (2020). The work integration social enterprises in Greece. *CIRIEC-España, Revista Jurídica de Economía Social y Cooperativa*, *36*, 195–219. https://doi.org/10.7203/CIRIEC-JUR.36.17289

Dyke, P., Bourke, J., Llewellyn, G., & Leonard, H. (2013). The experiences of mothers of young adults with an intellectual disability transitioning from secondary school to adult life. *Journal of Intellectual & Developmental Disability*, *38*(2), 149–162. https://doi.org/10.3109/13668250.2013.789099

Elorriaga, E., Restrepo, W., & Zulueta, B. (2019). *Modelo de apoyos individuales en Lantegi Batuak. Manual práctico*. Lantegi Batuak Fundazioa.

Engelbrecht, M., Shaw, L., & Van Niekerk, L. (2017). A literature review on work transitioning of youth with disabilities into competitive employment. *African Journal of Disability*, *6*(298), 1–7. https://doi.org/10.4102/ajod.v6i0.298

Eraut, M. (2004). Informal learning in the workplace. *Studies in continuing education*, *26*(2), 247–273. https://doi.org/10.1080/158037042000225245

Eurofound. (2013). *Impact of the crisis on working conditions in Europe*. European Foundation for the Improvement of Living and Working Conditions.

European Union. (2010). *European disability strategy 2010-2020: A renewed commitment to a barrier-free Europe*. European Union.

Farley, R. (1988). *Vocational self-awareness scale*. University of Arkansas Research and Training Center in Vocational Rehabilitation.

*Fernández-Solano, A. J., Del Baño-Aledo, M. E., & Rodríguez-Bailón, M. (2019). From thinking to acting: Occupational self-analysis tools for use with people with intellectual disability. A pilot study. *Journal of Intellectual Disability Research*, *63*(9), 1086–1096. https://doi.org/10.1111/jir.12621

Fici, A. (2020). La empresa social italiana después de la reforma del tercer sector. *CIRIEC-España, Revista Jurídica de Economía Social y Cooperativa*, *36*, 177–193. https://doi.org/10.7203/CIRIEC-JUR.36.17109

Glass, G. V., McGaw, B., & Smith, M. L. (1981). *Meta-analysis in social research*. SAGE.

Gilson, C. N., Carter, E. W., & Biggs, E. E. (2017). Systematic review of instructional methods to teach employment skills to secondary students with intellectual and developmental disabilities. *Research and Practice for Persons with Severe Disabilities*, *42*(2), 89–107. https://doi.org/10.1177/1540796917698831

Goldman, B. M., Gutek, B. A., Stein, J. H., & Lewis, K. (2006). Employment discrimination in organizations: Antecedents and consequences. *Journal of Management*, *32*, 786–830. https://doi.org/10.1177/0149206306293544

Gonon, P., Kraus, K., Oelkers, J., & Stolz, S. (2008). *Work, education and employability*. Peter Lang.

Gresham, F. M., & Elliott, S. N. (1990). *Social skills rating system (SSRS)*. American Guidance.

Harrison, P., & Oakland. T. (2015). *Adaptive behavior assessment system* (3rd ed.). Western Psychological Services.

*Hatfield, M., Falkmer, M., Falkmer, T., & Ciccarelli, M. (2017). Effectiveness of the BOOST-A™ online transition planning program for adolescents on the autism spectrum: A quasi-randomized controlled trial. *Child and Adolescent Psychiatry and Mental Health*, *11*(54), 1–12. https://doi.org/10.1186/s13034-017-0191-2

*Hayes, G. R., Custodio, V. E., Haimson, O. L., Nguyen, K., Ringland, K. E., Ulgado, R. R., Waterhouse, A., & Weiner, R. (2015). Mobile video modeling for employment interviews for individuals with autism. *Journal of Vocational Rehabilitation*, *43*, 275–287. https://doi.org/10.3233/JVR-150775

Hedges, L., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Harcourt, Brace, & Jovanovich.

Hedley, D., Uljarevic, M., Cameron, L., Halder, S., Richdale, A., & Dissanayake, C. (2017). Employment programmes and interventions targeting adults with autism spectrum disorder: A systematic review of the literature. *Autism*, *21*(8), 929–941. https://doi.org/10.1177/1362361316661855

Higgins, J. P. T., & Thompson, S. G. (2002). Quantifying heterogeneity in a meta-analysis. *Statistics in Medicine*, *21*, 1539–1558. https://doi.org/10.1002/sim.1186

Hofmann, C., Häfeli, K., Müller, X., & Krauss, A. (2021). Transition from low-threshold vocational education and training to work in Switzerland: Factors influencing objective and subjective career success. *International Journal for Research in Vocational Education and Training*, *8*(2), 136–159. https://doi.org/10.13152/IJRVET.8.2.1

Holland, J. L, Daiger, D. C., & Power, P. G. (1980). *My vocational situation*. Consulting Psychologists Press.

Ibáñez, P., & Mudarra, M. J. (2005). Relaciones sociales en el empleo, en trabajadores con discapacidad. *Educación XXI*, *8*, 105–125.

International Labour Organization. (ILO) (2016). *Including persons with disabilities in Technical and Vocational education and training. A guide for administrators and instructors to disability inclusion*. International Labour Organization.

*Ipsen, C., Kurth, N., McComick, S., Hall, J., & Chambless, C. (2019). Exploring the PROMISE of transition services for youth with disabilities receiving SSI. *Journal of Vocational Rehabilitation*, *50*, 95–108. https://doi.org/10.3233/JVR-180991

Jordan, S., Gessnitzer, S., & Kauffeld, S. (2016). Effects of a group coaching for the vocational orientation of secondary school pupils. *Coaching: An International Journal of Theory, Research and Practice*, *9*(2), 143–157. https://doi.org/10.1080/17521882.2016.1210185

Koren, P., DeChillo, N., & Friesen, B. (1992). Measuring empowerment in families whose children have emotional disabilities: A brief questionnaire. *Rehabilitation Psychology*, *37*(4), 305–321. https://doi.org/10.1037/h0079106

*Kumakazi, H., Warren, Z., Corbett, B. A., Yoshikawa, Y., Matsumoto, Y., Higashida, H., Yuhi, T., Ikeda, T., Ishiguro, H., & Kikuchi, M. (2017). Android robot-mediated mock job interview sessions for young adults with autism spectrum disorder: A pilot study. *Frontiers in Psychology*, *8*, 169. https://doi.org/10.3389/fpsyt.2017.00169

Lee, G. K., Chun, J., Hama, H., & Carter, E. W. (2018). Review of transition and vocational interventions for youth and adults with autism spectrum disorders. *Review Journal of Autism and Developmental Disorders*, *5*, 268–284. https://doi.org/10.1007/s40489-018-0138-4.

*Lindstrom, L., Doren, B., Post, C., & Lombardi, A. (2013). Building career PATHS (Postschool Achievement Through Higher Skills) for young women with disabilities. *The Career Development Quarterly*, *61*, 330–338. https://doi.org/10.1002/j.2161-0045.2013.00059.x

Lipsey, M. W. (1994). Identifying potentially interesting variables and analysis opportunities. In H. Cooper & L. V. Hedges (Eds.), *The handbook of research synthesis* (pp. 111–123). Russel Sage Foundation.

Lipsey, M. W. (2009). Identifying interesting variables and analysis opportunities. In H. M. Cooper, L. V. Hedges & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis* (pp. 147–158). SAGE.

Llinares L., Córdoba, A. I., & González-Navarro, P. (2020a). La empleabilidad a debate: ¿qué sabemos sobre la empleabilidad como estrategia de cambio social? *CIRIEC-España, Revista Jurídica de Economía Social y Cooperativa*, *36*, 313–363. https://doi.org/10.7203/CIRIEC-JUR.36.17017

Llinares L., Córdoba, A. I., Zacarés, J. J., & González-Navarro, P. (2020b). Indicadores de empleabilidad: De la inclusión al desarrollo de las carreras laborales. *CIRIEC-España, Revista Jurídica de Economía Social y Cooperativa*, *36*, 365–387. https://doi.org/10.7203/CIRIEC-JUR.36.17016

Llinares, L., Zacarés, J. J., & Córdoba, A. I. (2016). Discussing employability: Current perspectives and key elements from a bioecological model. *Employee Relations*, *38*(6), 961–974. https://doi.org/10.1108/ER-07-2015-0145

Lombardi, A., Gerdes, H., & Murray, C. (2011). Validating an assessment of individual actions, postsecondary supports, and social supports of college students with disabilities. *Journal of Student Affairs Research and Practice*, *48*, 107–126. https://doi.org/10.2202/1949-6605.6214

López-Bastías, J. L. (2019). La conceptualización de la discapacidad a través de la historia: Una mirada a través de la evolución de la normativa. *Revista de la Facultad de Derecho de México*, *69*(273), 835–855. https://doi.org/10.22201/fder.24488933e.2019.273-2.68632

Madans, J., Loeb, M., & Eide, A. H. (2017). Measuring disability and inclusion in relation to the 2030 Agenda on Sustainable Development. *Disability and the Global South*, *4*(1), 1164–1179.

Maffiioletti, E. U., & Sato, C. (2020). A inserçao social e laboral de grupos vulneráveis nos empreendimentos sociais no Brasil por meio das cooperativas. *CIRIEC-España, Revista Jurídica de Economía Social y Cooperativa*, *36*, 249–272. https://doi.org/10.7203/CIRIEC-JUR.36.17168

Marhuenda, F. (2018). Learning at work: Researching personal development and competence building in work integration companies. *Educar*, *54*(2), 491–509.

Marhuenda, F. (2021). Apprenticeships for adulthood. The contribution of the third sector to non-formal vocational education. In P. Eigenmann, P. Gonon & M. Weil (Eds.), *Opening and extending vocational Education* (pp. 291–318). Peter Lang.

Martin, J., & Marshall, L. (1993). *The self-directed IEP*. University of Colorado at Colorado Springs.

Martínez-Ríos, B. (2011). *Pobreza, Discapacidad y Derechos Humanos. Aproximación a los costes extraordinarios de la discapacidad y su contribución a la pobreza desde un enfoque basado en los derechos humanos*. Ediciones Cinca.

*Mawhood, L., & Howlin, P. (1999). The outcome of a supported employment scheme for high-functioning adults with autism or asperger syndrome. *Autism*, *3*(3), 229–254. https://doi.org/10.1177/1362361399003003003

McInnes, M. D. F., Moher, D., Thombs, B. D., McGrath, T. A., Bossuyt, P. M., Clifford, T., Cohen, J. F. et al. (2018). Preferred reporting items for a systematic review and meta-analysis of diagnostic test

accuracy studies: The PRISMA-DTA statement. *JAMA*, *319*(4), 388–396. https://doi.org/10.1001/jama.2017.19163

McWhirter, E. H., Rasheed, S., & Crothers, M. (2000). The effects of high school career education on social-cognitive variables. *Journal of Counseling Psychology*, *47*(3), 330–341. https://doi.org/10.1037/0022-0167.47.3.330

Meira, D. (2020). O fin mutualístico desiteressado our altruísta das cooperativas de solidariedade social. *CIRIEC-España, Revista Jurídica de Economía Social y Cooperativa*, *36*, 221–247. https://doi.org/10.7203/CIRIEC-JUR.36.17386

Merino, R. (2007). Pathways from school to work: Can the competence acquired in leisure activities improve the construction of pathways? *Journal of education and work*, *20*(2), 139–159. https://doi.org/10.1080/13639080701314696

Merino, R. (2019). Los componentes no formales de los itinerarios formativos de los jóvenes, ¿refuerzan o compensan las desigualdades sociales en educación? *Revista de estudios de juventud*, *124*, 209–226.

Metheny, J., McWhirter, E. H., & O'Neil, M. E. (2008). Measuring perceived teacher support and its influence on adolescent career development. *Journal of Career Assessment*, *16*, 218–237. https://doi.org/10.1177/1069072707313198

Morelock, K., Roessler, R., & Bolton, B. (1987). The employability maturity interview: Reliability and construct validity. *Vocational Evaluation & Work Adjustment Bulletin*, *20*(2), 53–59.

*Murray, C., & Doren, B. (2013). The effects of working at gaining employment skills on the social and vocational skills of adolescents with disabilities: A school-based intervention. *Rehabilitation Counseling Bulletin*, *56*(2), 96–107. https://doi.org/10.1177/0034355212452614

National Institute of Stastistics. (2019). *El empleo de las personas con discapacidad 2017*. National Institute of Stastistics.

National Institute of Stastistics. (2017). *El salario de las personas con discapacidad 2014*. National Institute of Stastistics.

Novo-Corti, I. (2018). La inclusión efectiva de las personas con discapacidad en un entorno laboral normalizado: Dificultades y retos. *Panorama Social*, *26*, 79–92.

Offer, D., Ostrov, E., Howard, K. I., & Dolan, S. (1992). *Offer self-image questionnaire*. Revised. Western Psychological Services.

*O'Mally, J., & Antonelli, K. (2016). The effect of career mentoring on employment outcomes for college students who are legally blind. *Journal of Visual Impariment & Blindness*, *110*(5), 295–307. https://doi.org/10.1177/0145482X1611000502

*Oswald, T. M., Winder-Patel, B., Ruder, S., Xing, G., Stahmer, A., & Solomon, M. (2017). A pilot randomized controlled trial of the ACCESS Program: A group intervention to improve social, adaptive functioning, stress coping, and self-determination outcomes in young adults with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *48*(5), 1742–1760. https://doi.org/10.1007/s10803-017-3421-9

Pallisera, M., Vilà, M., Fullana, J., Castro, M., Puyaltó, C., & Díaz-Garolera, G. (2017). Proposals for improving the transition process of young people with intellectual disabilities in Spain: Insights from focus groups of professionals, young people and their families. *European Journal of Special Needs Education*, *33*(3), 1–15. https://doi.org/10.1080/08856257.2017.1306966

Park, E., Kim, J., & Kim, S. (2016). Meta-analysis of the effect of job-related social skill training for secondary students with disabilities. *Journal of Vocational Rehabilitation*, *44*, 123–133. https://doi.org/10.3233/JVR-150785

*Powers, L. E., Turner, A., Westwood, D., Matuszewski, J., Wilson, R., & Phillips, A. (2001). TAKE CHARGE for the future: A controlled field-test of a model to promote student involvement in transition planning. *Career Development and Transition for Exceptional Individuals*, *24*(1), 89–104. https://doi.org/10.1177/088572880102400107

Randolph, C., Tierney, M. C., Mohr, E., & Chase, T. N. (1998). The repeatable battery for the assessment of neuropsychologicalstatus (RBANS): Preliminary clinical validity. *Journal of Clinical and Experimental Neuropsychology*, *20*, 310–319. https://doi.org/10.1076/jcen.20.3.310.823

Rodríguez-Bailón, M., Pulido-Navarro, M. J., Bravo-Quirós, A., Alberto-Cantizano, M. J., Rubio-Fernández, V., & Fernández-Solano, A. J. (2016). Seeing, judging and …acting! Improving health perception and meaningful occupational participation in older Spanish adults. *Educational Gerontology*, 42, 572–584. https://doi.org/10.1080/03601277.2016.1205384

Review Manager (RevMan) [Computer program]. (2014). Version 5.3. The Cochrane Collaboration.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press.

Rottinghaus, P. J., Day, S. X., & Borgen, F. H. (2005). The career futures inventory: A measure of career-related adaptability and optimism. *Journal of Career Assessment*, *13*(1), 3–24. https://doi.org/10.1177/1069072704270271

Salinas, M. F., & Marhuenda, F. (2020). Acceso al empleo de las personas con discapacidad: Situación en el empleo en las personas con enfermedad mental. *CIRIEC-España, Revista Jurídica de Economía Social y Cooperativa*, *36*, 273–311. https://doi.org/10.7203/CIRIEC-JUR.36.16980

Sánchez-Meca, J., & Botella, J. (2010). Revisiones sistemáticas y meta-análisis: Herramientas para la práctica profesional. *Papeles del Psicólogo*, *31*(1), 7–17.

Sandoya, E. (2008). Metaanálisis: Fortalezas y debilidades. *Revista Uruguaya de Cardiología*, *23*(3), 263–275.

Schur, L., Kruse, D., Blasi, J., & Blanck, P. (2009). Is disability disabling in all workplaces? Workplace disparities and corporate culture. *Industrial Relations*, *48*, 381–410. https://doi.org/10.1111/j.1468-232X.2009.00565.x

Senent-Ramos, M. (2020). Functional diversity or disability? Social and conceptual challenges of the new educational paradigms. *Culture and Education*, *32*(1), 17–26. https://doi.org/10.1080/11356405.2019.1709397

*Smith, M. J., Ginger, E., Wright, K., Wright, M. A., Taylor, J. L., Humm, L. B., Olsen, D. E., Bell, M., & Fleming, M. F. (2014). Virtual reality job interview training in adults with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *44*, 2450–2463. https://doi.org/10.1007/s10803-014-2113-y

*Strickland, D. C., Coles, C. D., & Sothern, L. B. (2013). JobTIPS: A transition to employment program for individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *43*, 2472–2483. https://doi.org/10.1007/s10803-013-1800-4

Taylor, J. L., McPheeters, M. L., Sathe, N. A., Dove, D., Veenstra-VanderWeele, J., & Warren, Z. (2012). A systematic review of vocational interventions for young adults with autism spectrum disorders. *Pediatrics*, *130*(3), 531–538. https://doi.org/10.1542/peds.2012-0682

Thompson, A., Lindeman, R., Super, D., Jordaan, J., & Myers, R. (1981). *Career development inventory: User's manual*. Consulting Psychologists Press.

United Nations. (2006). Convention on the rights of persons with disabilities. United Nations. https://www.un.org/disabilities/documents/convention/convoptprot-e.pdf

*Verdugo, M. A., Jenaro, C., & Arias, B. (1998). Outcomes of a program of vocational evaluation for persons with physical disabilities and deafness. *Journal of Vocational Rehabilitation*, *11*(3), 181–194. https://doi.org/10.3233/JVR-1998-11304

Wakabayashi, A., Tojo, Y., Baron-Cohen, S., & Wheelwright, S. (2004). The autism spectrum quotient (AQ) Japanese version: Evidence from high-functioning clinical group and normal adults. *Shinrigaku Kenkyu*, *75*, 78–84. https://doi.org/10.4992/jjpsy.75.78

Walsh, E., Holloway, J., McCoy, A., & Lydon, H. (2017). Technology-aided interventions for employment skills in adults with autism spectrum disorder: A systematic review. *Review Journal of Autism and Developmental Disorders*, *4*(1), 12–25. https://doi.org/10.1007/s40489-016-0093-x

Walther, A. (2006). *Regimes of youth transitions. Young*, *14*(2), 119–139. https://doi.org/10.1177/1103308806062737

Wehmeyer, M. L., & Kelchner, K. (1995). *The arc's self-determination scale*. Arc.

Williams, G., & Deci, E. (1996). Internalization of biopsychosocial values by medical students: A test of self-determination theory. *Journal of Personality and Social Psychology*, *70*(4), 767–779. https://doi.org/10.1037/0022-3514.70.4.767

Wolman J., Campeau, P., Dubois, P., Mithaug, D., & Stolarski, V. (1994). *AIR self-determination scale and user guide*. American Institute on Research.

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Gendered Vocational Identities – Female Students' Strategies for Identity Formation During Workplace-Based Learning in Male-Dominated Work

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Abstract

Purpose: This article investigates female vocational students' strategies for becoming part of a workplace community, what these strategies are and how they are tied to the formation of vocational identities within male-dominated industrial work. Of particular interest is how female students enrolled on Swedish upper secondary industrial programmes experience workplace-based learning at industrial workplaces as part of their vocational education. The theoretical framework derives from Wenger's concept of community of practice, but his theoretical concept does not explicitly include gender dimensions. Therefore, the concept of community of practice is also combined with Paechter's assumption of gender, whereby femininity and masculinity can be considered as different communities of practice.

Methods: The article draws on evidence from a Swedish study based on interviews with 20 female students enrolled on the industrial programme at six upper secondary schools. In this vocational programme, there is a distinct gender distribution and only a small minority of the students on the programme are girls. In the analysis, the focus is on the female students' strategies used during workplace-based learning to become part of the work community which consists almost exclusively of male workers.

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Findings: The female students deliberately negotiated vocational identities as female industrial workers to become accepted in the male-dominated work community. The findings highlight three specific strategies that the female students used: Acting like gender does not matter, acting like boys (not like drama queens), and acting tough and joking around. The female students' strategies were part of – and tied to – a complex vocational identity formation process that featured contradictory requirements. By taking individual responsibility, they identified relevant information for becoming industrial workers and chose to act like boys. The female students saw no problem with being a girl, yet they struggled with implicit, diffuse and hidden gender structures and prejudices in the male-dominated industrial companies. Nevertheless, they strived for what they perceived to be an attractive vocational identity as industrial workers; it was an alternative, atypically feminine way of being that attracted the female students.

Conclusions: The study concludes that female students mostly rely on their individual agency when interacting with others in the male-dominated workplace community. A "gendered vocational identity" is formed which shows that the identity formation of female students is a complex double process, in which vocational and gender identities are formed simultaneously and in parallel within the male-dominated workplace.

Keywords: VET, Vocational Education and Training, Vocational Identity Formation, Gender, Student, Workplace-Based Learning

1 Introduction

This paper focuses on female vocational students' strategies for forming a vocational identity as industrial workers in the male-dominated industrial sector. Of particular interest is how female students enrolled on the Swedish upper secondary industrial programme experience workplace-based learning at industrial workplaces as part of their vocational education. Workplace-based learning has been found to have a great significance for vocational students' vocational identity formation (Helms Jørgensen, 2013; Klotz et al., 2014). As Klotz et al. (2014, p.17) suggest, students "cannot form worthwhile, robust vocational identities without experiencing work and without actively engaging and learning in workplaces". A close relationship between students' workplace-based learning and their access to the work community in industrial companies seems paramount for the potential strategies students use to learn their chosen vocation and develop a vocational identity (Evans et al., 2010; Ferm et al., 2018). Therefore, a vocational identity can be seen as a determination for becoming a member of a vocational community (Armishaw, 2007), which implies actively engaging in the workplace. With regard to the female students' minority position on the industrial programme and during their workplace-based learning at companies, their gender position

can have a significant impact on the formation of a vocational identity as industrial workers (Ledman et al., 2020; Paola Sevilla et al., 2019).

The Swedish upper secondary industrial programme features a distinct gender distribution. Only a small minority of the vocational students on the programme are girls. In the academic year 2019/2020, 10.8 per cent were female. The number of female students has, however, increased slightly since 2011 when the programme was launched in its current form, but was at its highest (11.6 per cent) in 2016 (Swedish National Agency for Education, 2020). Attempts made by feminists, researchers and unionists to highlight the issue of gender segregation in male-dominated vocational programmes and to illuminate the social and economic advantages of a higher percentage of female students have not yet had any significant impact on the number of female students on such programmes (Struthers & Strachan, 2019). There is growing interest in examining the implications of gender in vocational education (Lappalainen et al., 2012; Tanggaard, 2006), and more specifically the experiences of female students in male-dominated vocational education (Paola Sevilla et al., 2019). However, studies of gender issues in different vocational education have had a primary focus on boys rather than girls in gender-segregated education (Ledman et al., 2020). Few studies (if any) have focused on female vocational students on the industrial programme and their preparation through workplace-based learning to enter a male vocational domain such as industrial manufacturing companies. Vocational education that relies largely on students' workplace-based learning such as the industrial programme also reflects the overall gender order found within the industrial sector and the labour market (Pleasant, 2019). Therefore, it is also important to consider gender issues in general when studying vocational education, because the vocation in itself can be gendered which affects the conditions for entering a specific vocation.

The knowledge gap presented above regarding female students' vocational identity formation, together with the strong gender segregation in industrial work and education, constitutes the background for this study. The aim of this article is thus to investigate female vocational students' strategies for becoming part of a workplace community, what these strategies are and how they are tied to the formation of vocational identities within male-dominated industrial work.

The female students who are the focus of this study will be referred to as girls in order to reduce the number of repetitions. The paper draws on evidence from a Swedish study based on interviews with 20 girls enrolled on the industrial programme at six upper secondary schools. In the analysis, the focus is on the girls' strategies for becoming part of the work community which consists almost exclusively of male workers in industrial companies. In the discussion, we argue that girls on the male-dominated industrial programme negotiate vocational identities as female industrial workers in a deliberate way during the workplace-based learning by using different strategies to become accepted as an industrial worker in the workplace.

2 Previous Research

This section presents previous research on barriers faced by girls on male-dominated vocational programmes, gender stereotypical expectations, and gendered discourses in vocational education and work.

2.1 Barriers for Girls in Male-Dominated Vocational Programmes

There are a few studies that focus on the challenges and barriers girls encounter due to gender in male-dominated vocational programmes. Paola Sevilla and colleagues (2019) have found that girls in male-dominated vocational education were exposed to benevolent sexism in the form of praise and protecting girls from hard work. Despite good intentions, this type of sexism operates as a barrier by influencing the work tasks girls are offered and making it difficult for girls to access learning opportunities and be accepted at workplaces (Paola Sevilla et al., 2019). For vocational female students subjected to sexist treatment at male-dominated workplaces, Tanggaard (2006) identified that their strategy was to participate in the male discourse by answering back and treating the men in the same way as they were treated. These female students actively refused to accept the role of an oppressed and intimidated girl (Tanggaard, 2006). A similar strategy was identified by Ely (1995) among women in male-dominated work, who dealt with sexist treatment by acting more like men and less in accordance with traditional femininity. Other studies have found that girls in male-dominated vocational programmes are viewed as weak and are therefore excluded or questioned when it comes to carrying out physically demanding work (Tanggaard, 2006; Åberg & Hedlin, 2015). Girls who chose to work in automotive engineering were seen as entering an overly dangerous and demanding job, while at the same time they were liked just for being feminine (Ledman et al., 2020). Korp (2011) discerned difficulties for girls on the male-dominated transport programme in terms of being feminine, because this was seen as something odd that boys made fun of.

Other studies have identified barriers related to vocational teachers' negative judgements of girls' unsuitable characteristics in relation to male-dominated vocational education. Lappalainen et al. (2012) found that female vocational teachers reproduced the stereotype that there is a lot of gossip and drama in situations where women are in the majority. These teachers viewed girls as more precise and prepared than boys, which they saw as characteristics that prevented girls from mapping important aspects of work in the same way boys did (Lappalainen et al., 2012). Kontio and Evaldsson (2015) discovered that vocational teachers on the vehicle engineering programme predicted that the few girls enrolled would drop out within a year, as they risked being marginalised due to the masculine norms that pervade the education. Girls who do not choose typically male vocations make a rational decision to

avoid the risk of discrimination and harassment (Colley, 2006), while girls in typically male-dominated vocational education seem to expect to have a harder time being accepted in the workplace than boys (Paola Sevilla et al., 2019).

2.2 Gender Stereotypical Expectations

Gender stereotypical expectations refer to the types of vocations that are deemed suitable (or unsuitable) for women and how women in traditional male-dominated vocational education and workplaces should behave and act, for example in construction and engineering (Struthers & Strachan, 2019). As Joan Acker's (2006) seminal research has shown, gender expectations are shaped in relation to the existing explicit and implicit gendered norms of a particular profession. Struthers and Strachan's (2019) investigation of secondary school girls' perceptions of the male-dominated automotive engineering and construction industries shows that they were exposed to gender expectations, suggesting that such vocations were options for boys who did not fit into academia. These types of expectations led to doubts about choosing education for a typically male vocation. These girls did not receive sufficient information about male-dominated programmes and vocations before applying for upper secondary school. The low status of male vocational education compared to academia was a factor the girls contemplated because they could make alternative educational choices in which they did not risk being intimidated due to their gender. These girls also were worried about adopting the identity of a male vocation which was not compatible with their feminine identity, and that they felt a fear of being stereotyping as unfeminine.

By contrast, Paola Sevilla et al. (2019) found that girls' choices of technical vocational education depended on their intention to do something that was regarded as atypically female. Further, Paola Sevilla and colleagues imply that the girls opposed what society considers to be typically feminine attributes by entering a traditionally male-dominated industrial specialisation. Resistance to a feminine identity was also a feature found among the girls studied by Ledman et al. (2020). By resisting femininity, the girls moved their position closer to the selected male vocational identity. Masculine attributes such as competition and direct confrontation permeate vocational identities on traditionally male vocational programmes (Tanggaard, 2006). Others' expectations of female students shape the way they adapt to masculine actions, and also when they had to provide a 'woman's touch' (Paola Sevilla et al., 2019) by applying certain qualities that boys lack, for example being careful, thorough (Ledman et al., 2020; Paola Sevilla et al., 2019). Such characteristics are also used as explanations why employers in male-dominated industries want to hire more female workers (Ledman et al., 2020).

Another gender expectation found by Korp (2011) was that girls on the male-dominated transport programme were supposed to handle the male banter. The female students who could handle the male humour were highly valued. Participating in the male banter

was something that the girls saw as an opportunity to present themselves as smart workers. Sometimes these girls had to act like men to be able to fit in on the male-dominated programme (Korp, 2011). Kontio and Evaldsson (2015) affirmed the same pattern on the vehicle engineering programme, where the girls were expected to participate in the male banter by receiving and making comments in the same way as the boys did on the programme.

2.3 Gendered Discourses in Vocational Education and Work

In previous research, two significant discourses appear – an individualistic discourse and a genderless discourse – in relation to vocational education and male-dominated vocations. The individualistic discourse focuses on self-conceptions. In relation to gender, self-conceptions can foster an uncritical acceptance of faults that one attributes to oneself, for example as a woman in comparison to men, to justify one's own 'negative' attitudes and shortcomings (Wetherell et al., 1987). In a study of girls, Colley (2006) discovered that they tended to believe that equal opportunities existed regardless of gender in working life and in choosing a vocation. At the same time, these girls were exposed to gender discrimination such as stereotyping and harassment in the workplace. As a consequence, they often blamed themselves, as they thought that the derogatory treatment had something to do with them as individuals rather than being related to gender inequalities and the contemporary societal structure. Gustavsson and Fogelberg Eriksson (2010) found that gender inequalities in a male-dominated manufacturing company were attributed to individuals' shortcomings, which reinforced the individualistic discourse and neutralised gender differences by stressing that everyone has the same chance for advancement within the company. Similar findings were noted by Korvajärvi (2002), who investigated clerical workers at an IT call centre and in a social work office. These clerical workers regarded gender as a private part of their individuality and as irrelevant to their work or anything that affected their opportunities to advance at work. Nevertheless, the gender structures created inequalities on a structural level, and gender issues were treated as irrelevant for work which was a part of the workplace culture (Korvajärvi, 2002).

Depicting gender as irrelevant is closely related to the discourse of 'genderless gender'. This discourse makes gender appear less important and suppresses the effects of gender by talking about both men and women as merely "individuals" in order to downplay issues of gender. In other words, gender does not matter (Lahelma, 2011; Lappalainen, 2012). The notion of genderless gender appears in Lappalainen et al.'s (2012) analysis of vocational teachers' reflections on gender-related in the male-dominated technology and transport programme. These teachers adopted a discourse of gender neutrality grounded in their professional code and dismissed the importance of gender in their dealings with students and colleagues. By contrast, the female vocational teachers had to deal with masculine vocational hierarchies in

order to be respected as vocational teachers (Lappalainen et al., 2012). Gender neutrality can be expressed through objective and professional ideals such as muting the role that gender plays in work-related relationships and instead adopting a discourse that gender does not matter (Risberg, 2004). Advocating inclusiveness in vocational education can also signify that gender does not matter. Paola Sevilla et al. (2019) refer to "apparently inclusive discourses that, by reducing the importance of the student's gender, obscure existing obstacles for female students to enter the industrial area" (Paola Sevilla et al., 2019, p. 14). This implies that there can be gendered structures in the shadow of equal conditions for individuals, creating unequal conditions for female and male students.

3 Theoretical Framework

The concept of communities of practice is selected as a theoretical foundation for analysing female vocational students' strategies for becoming part of a workplace community, what these strategies are and how they are tied to the formation of gendered vocational identities in male-dominated industrial work. Being a member of a community of practice implies a commitment to participating and engaging in a joint activity within a specific area or domain which defines the community's identity (Wenger, 2010). In this case, the community's identity is tied to male-dominated industrial work. A community of practice provides a foundation for learning and collaboration, creating relationships and mutual trust among its members (Wenger, 1998). Each community of practice develops its own repertoire of tools, methods, routines and work activities by sharing knowledge and experiences (Wenger, 1998). When entering a particular community of practice, apprentices (students) are legitimate peripheral participants and, with experience, they become full participants who gradually develop identities (Lave & Wenger, 1991). An apprentice must be able and allowed to engage actively with experienced workers and gain access to the joint repertoire used in the community of practice. However, as Fuller and Unwin (2003) argue, apprentices' participation in a community of practice varies depending on whether they have access to a range of vocational qualifications and whether formal arrangements are designed to support the apprentices' participation and identity development.

Engaging with others entails active negotiation of ways of being and strategies for meeting and dealing with the requirements of the community. As Wenger (2010) argues, in the process of negotiation every community of practice invites the apprentices into a new identity that fosters certain ways of being and performing in the practice of the community. Evans et al. (2010) suggest that vocational students who alternate between school and workplaces form strategies when integrating what they have learned at school with experiences from collaborating with skilled workers during workplace-based learning. Strategies are not always well thought out and rational. In fact, students can be unaware of the strategies used in work

until they look back at their experiences in hindsight (Evans et al., 2010). As we have shown elsewhere (Ferm et al., 2018), students' vocational identities are developed in response to different strategies of learning, such as taking individual responsibility, asking questions and finding role models to become a member in a community of practice.

While we recognise the relevance of the community of practice approach for analysing the female vocational students' strategies for becoming part of a male-dominated community and vocational identity formation, we identify shortcomings in this theoretical approach because it does not explicitly incorporate gender dimensions. In this regard, inspired by Paechter's (2003) approach to communities of practice, we move to the idea that femininity and masculinity can be regarded as different communities of practice. Looking at femininity and masculinity as communities of practice means that the focus is on how gender is done by participating in everyday situations (Paechter, 2003; West & Zimmerman, 1987). This signifies that gender is connected to participation and, as Wenger (2010, p.141) puts it, "women who seek equal opportunity often find that the practices of certain communities never cease to push them back into identities of non-participation". According to Wenger (2010), non-participation is just as relevant as participation. He adds that non-participation does not necessarily develop an identity as an outsider who is marginalised. However, it is not always up to individuals to choose freely which communities of practice to participate in. Certain communities may be reluctant or refuse to include certain people for various reasons.

Paechter (2003) argues that women and men form femininities and masculinities differently within a community of practice. Therefore, femininity and masculinity are associated with local ways of dealing with norms and ideals in a community of practice, and this is an important part of individuals' identity formation (Paechter, 2003; Tanggaard, 2006). What is expected of male and female members is constantly under negotiation, and they are not fixed roles (Paechter, 2006a). Within different communities of practice, the meaning of being a woman or a man is constantly negotiated and reproduced (Paechter, 2003). This means that gender is continually done by individuals in different communities (Paechter, 2003; West & Zimmerman, 1987).

Nevertheless, both women and men as individuals may do gender differently, depending on which community they find themselves in, and new members learn what it means to be a woman or man when entering the community. This learning process forms a shared practice of trying to live up to norms and ideals of being a woman or a man in a specific community of practice. This shared practice may also lead to the formation of localised masculine and feminine identities (Paechter, 2003). However, when individuals do gender, they do not always live up to traditional expectations of femininity or masculinity. Even when they do gender in untraditional ways, their behaviour is still interpreted based on their gender (West & Zimmerman, 1987). For example, not aligning to the ideals of what it means to be a woman or a man in an established community of practice may lead to exclusion from the community (Paechter, 2003).

A community of practice can be maintained as long as there are forces of power that pervade formal and informal gender structures. In this sense, belonging to a community of practice means that one must identify with its recognisable power dynamics to form an identity (Wenger-Trayner & Wenger-Trayner, 2015). As Paechter (2006a) emphasises, power and gender are closely connected and influence how communities of practice will function, the degree of power they will have and who will be granted access to participation. Membership will only be provided to those who fully grasp what it means to be a woman or a man in that specific community, which involves being and behaving in ways that are accepted by the community (Paechter, 2006a). Power and knowledge are always connected, and different types of knowledge are coded as masculine or feminine, but are also ascribed different statuses in different communities of practice (Paechter, 2003). One way to claim power is to disconnect oneself from femininity, and this distancing may include disidentification with women and identification with men (Paechter, 2006b).

4 Research Context

The study was conducted at six Swedish upper secondary schools offering the industrial programme. The industrial programme is male-dominated, and currently just under 11 per cent of the students are female. In Sweden, each upper secondary programme lasts for three years and the students enrolled are between 16 and 19 years old. Of the 18 programmes offered within the Swedish upper secondary school system, six are higher preparatory programmes and twelve are vocational programmes. The upper secondary vocational programmes are offered as two different models, a school-based model and an apprenticeship model. The school-based model must provide a minimum of 15 weeks of workplace-based learning, while in the apprenticeship model 50 per cent of the entire education must comprise workplace-based learning. Formally, the time students spend on workplace-based learning is different in the two models, but in practice this difference is not significant. Regardless of the model, each school has considerable scope for manoeuvre to determine the length of students' workplace-based learning. In other respects, there are no major differences. Both models' main curriculum goals are to provide familiarisation with industrial work and the role of an industrial worker. Both models lead to the same type of qualification.

5 Method

The study is based on a qualitative research approach, and includes 19 interviews with 20 girls enrolled on the industrial programme at six different upper secondary schools.

The research that is carried out in this study has been approved by the Regional Ethics Board in Linköping (ref. 2014/438-31).

5.1 Selection of Participants

The selection of girls was conducted in two steps. In the first step, carried out in 2015, eleven girls were selected for the larger research project. At this stage of the project, both girls and boys were selected since being a female student in the male-dominated industrial sector was not an exclusive focus. The overall focus was on students' vocational learning and identity formation as industrial workers. During these first interviews with the eleven female students, they described their experiences and feelings in relation to being a girl on a male-dominated vocational programme and in male-dominated workplaces. In the second selection step in 2019, nine additional girls were selected.

In both selection steps, the girls were contacted through the principals responsible for the industrial programmes at the six schools. The principals were provided with written information by email about the research study. After the principals had given their informed consent, they informed the students. Girls who voluntarily decided to participate in the study were contacted at the school by the researchers.

The interviewed girls were between 18 and 20 years old. Five of the girls were enrolled in the apprenticeship model of the industrial programme, while the remaining 15 were studying the school-based model. Fifteen girls were in their third and final year of the programme, and five girls were studying their second year. All 20 girls had experience of workplace-based learning within process industries and manufacturing companies of varying sizes, from a few employees to multinational industrial companies with several hundred employees. The most common vocational orientation amongst the girls interviewed (eight girls) was welding, although other orientations were also represented such as operations and maintenance or production and machine technologies.

5.2 Data Collection

All interviews took place at the schools and were conducted individually with the girls, with one exception of two girls who wished to be interviewed together. The first interview round was carried out by the two authors and a research colleague in the research project, and the second round by the first author of this article. The interviews ranged from 24 minutes to 85 minutes but lasted approximately an hour. The interviews were semi-structured with guidance from an interview guide. The first round of interviews covered questions about workplace-based learning, ways and conditions for learning a vocation and an identity as an industrial worker. In the second interview round, the same interview questions as in the first round were used, but additional questions that explicitly focused on gender were added, for example: "What are your experiences of being a student in a male-dominated workplace?" and "How do you experience the way that boys and girls are treated in the workplace where you conduct your workplace-based learning?"

The girls talked openly about their experiences, thoughts and feelings about the subjects, and the researchers followed up by clarifying or providing supplementary questions to expand the answers. All the interviews were recorded and transcribed.

5.3 Data Analysis

The analysis was carried out inductively in a sequence of steps inspired by Braun and Clarke's (2006) qualitative thematic analysis. In the first step, all interviews were read repeatedly, in order to become familiar with the material (Braun & Clarke, 2006). In the next step, extracts where the girls mentioned experiences or thoughts that explicitly related to them being female or the gender division in the industrial sector were collected in a separate document for further analysis. This document contained extracts from both the first and second rounds of analysis and was interpreted as comprehensive material containing coherent empirical data. The extracts were read several times and notes were taken during the analysis process, focusing on parts of the interviews where the girls actualised gender issues on their own and where the researchers introduced the subject of gender.

In the extracts, eight recurrent categories were identified: Advantages of being a girl, disadvantages of being a girl, gender does not matter, preferring the company of boys, the attitude of a female industrial worker, being treated as fragile, the importance of other girls, and plans for the future. These categories were then further analysed. During this part of the analysis process, it became evident that the categories shown that the girls had a high degree of individual agency in the process of forming a vocational identity. This discovery led to a further analysis step in which the categories were reduced into three strategies that illustrate how the girls' individual agency created ways to act in the workplaces to become a part of the work community and form a vocational identity as industrial workers. These strategies are presented in the findings section below.

In the presentation, the female students from the first round of interviews have been given names beginning with A while the girls interviewed in the second round have been given names starting with B.

6 Findings

The findings demonstrate three strategies that the female vocational students used during their workplace-based learning for becoming part of a workplace community that consisted almost exclusively of male workers. Using these strategies, the girls negotiated their gendered vocational identities to be accepted as industrial workers in male-dominated companies.

6.1 Acting Like Gender Does not Matter

One important strategy used by the girls was to downplay gender issues by talking about how gender does not matter. The girls approached gender issues by pointing out that gender did not create any problems; gender was thus viewed as a non-issue. The gender expectations the girls placed on themselves were to repeatedly act in ways which showed that gender did not matter, for example by answering that it made no difference to their workplace-based learning and that the gender division of the industrial education and vocation did not matter much to them. The girls said that they did not think of gender because it was not a relevant issue for learning the work as an industrial worker or gaining access to working life experience. Instead, it was important for the girls to employ a strategy that focused on expressing a neutral identity as an industrial worker rather than focusing on themselves as belonging to an underrepresented gender.

> Bella: I don't usually think about things like why there aren't that many girls here, you know, I mostly think about what I'm about to do, my work. It doesn't matter that much to me.

The girls' focus was on the work and on alignment to the workplace culture, rather than on gender issues related to the vocation. Many female students perceived that they were treated in the same way as the boys who were vocational students at the workplaces. The girls saw no difference between them and the boys in terms of how they were instructed by the workers or when it came to receiving help when needed. The girls often emphasised that they were not excluded due to their gender.

> *Britta: Everyone is very nice over there (at the workplace), it's not like you are excluded just because you are new or a girl or anything like that, we usually play cards or just sit and chat.*
> *Bea: They treat me very well, it makes no difference to them whether I'm a girl or a boy, they believe in me regardless. It's nothing special at all.*

Later in the interviews, despite the fact that the girls often used the strategy of acting like gender does not matter in order to gain acceptance in the workplace community, it was apparent that they were sometimes treated differently due to their gender. This treatment could be both positive and negative, bring both advantages and disadvantages when entering the male-dominated workplaces. Some examples of advantages that the girls mentioned were that they were seen as attractive employees by companies that strived for a more even gender distribution. They were also considered to possess qualities that boys lacked, such as being thorough and precise when performing certain tasks. Examples of disadvantages the girls described were that they were seen as too fragile for industrial work or as outsiders who did not have a natural place in the company.

In the interview below, two girls who had experienced being treated negatively due to their gender discuss the question of what it is like being in a male-dominated workplace.

> Bea: Well, I actually don't care that much.
> Becky: No, me neither. I was raised with men.
> Bea: Yes. I'm there to work, I don't care if… = if there is ((laughing))
> Becky: … if there aren't any girls.
> Bea: I can kind of work with anyone.
> Becky: It's like, nothing special.

The two girls found explanations that reinforced that gender did not matter, such as that they did not care and they could work with anyone even though they could be treated differently in a negative way. The strategy of acting like gender does not matter was a way to convince themselves and others that gender was not a problem. Aligning with the work community implied not focusing a lot on gender issues, but rather adopting the traditionally masculine culture of the workplaces. The gender neutrality façade was a beneficial way to gain acceptance, but in some situations the girls felt that they were treated differently due to their gender.

6.2 Acting Like Boys – Not Like Drama Queens

Another strategy that the girls used to fit into the male-dominant community was to adopt masculine behaviours and to distance themselves from the negative image of girls as drama queens. For example, they actively engaged in establishing masculinity, such as participating in the industrial jargon, making fun of the other workers and coping with being joked with, getting their hands dirty and working with heavy tasks. Some girls felt more natural and comfortable in the company of boys than with other girls.

> Belinda: I didn't play a lot with dolls or Barbies or things that are thought of as girly, I was more out playing in the sandbox and with cars. I played a lot with my big brother when I was little. So, I guess it's been a part of my upbringing, that I haven't played that much with girly things, so for me it's completely natural that… I think it's nice that there are only boys.

Adopting traditionally masculine ways of acting allowed the girls to distance themselves from the "drama" that they perceived other girls often created in social situations, such as talking behind each other's backs or being easily offended by banter. Some girls felt that boys did not engage in such activities to the same extent as girls, which is why the female students often tended to prefer the company of boys.

> Anna: It is mostly nice because there are just lads in the class… there are no girl dramas. I guess there have been some, but none that I have participated in.

One way for the female students to distance themselves from traditional femininity was to act like relaxed workers who did not participate in drama. Being relaxed also involved dissociating themselves from a 'feminine sensitivity', a way of acting among women that was often considered to results in insults and conflicts.

> Bella: My sense of humour is more like that of a boy.
> Researcher: What does that mean?
> Bella: Well, some different things I suppose. It's kind of like… most boys don't care that much about what they say and who might feel offended by it. But with girls, if you say something wrong, most of them are like 'You can't say that, what if he feels offended or what if she feels like that'. I think that is kind of hard.

The girls were often attracted by industrial work because they wanted to do something that was not typically feminine. Therefore, they saw male-dominated industrial work as an alternative way to change their identity and not be seen as a 'little girl' anymore, as one of the girls put it. One girl explained that she "wanted to do something that not all other girls do". Another girl expressed that she found enjoyment and satisfaction in being the only girl on the shop floor among the male workers.

> Agnes: I didn't mind it at all, being the only girl on the floor. It didn't bother me at all, it was almost just fun to get to feel what it was like to be alone. To not be able to go to somebody and cry about how someone was mean to me, because you don't exactly do that to a boy if you are a girl.

As the quotation illustrates, feeling enjoyment at being the only girl in the work community also indicates that it was not necessary to have female workmates. Despite being biased in their actions towards masculine gender forms, the girls did not necessarily disengage from other girls. Later in the interviews, some girls suggested that in order to attract more girls to enrol on the industrial programme there could be female ambassadors to rectify the low number of girls in industrial work. On the other hand, the girls explained that other girls could have a bad impression of industrial work as being heavy and dirty, which was considered an incorrect perception as industrial work had changed. Due to the misleading image of industrial work, their opinion was that more girls would be encouraged to apply to the industrial programme and work at companies if they had the opportunity to experience what it really was like.

6.3 Acting Tough and Joking Around

The third strategy that the girls used was to adopt an attitude of acting tough and joking around, to fit into the male-dominated work community and to deal with the resistance they sometimes encountered in workplaces due to their gender. For example, several girls described experiences of being seen as more fragile than boys in situations where they were

faced with heavy lifting or being subjected to masculine banter. As a consequence of this female attribution, they felt that their capacity to execute the work was questioned, as was their ability to deal with the banter in the work community. Part of the strategy was not to take things personally or be offended and to ignore the male workers' negative perceptions about female workers in general. Instead, the girls expressed that a useful way of dealing with the men's jokes was to show that they appreciated the banter.

> Anna: You have to show that you think their jokes are funny and that it's OK to joke with me, and that you're not shy but can handle most things. […] It's a lot of, well it can be everything from racist jokes to sex jokes, so you have to take it with a pinch of salt.

If one part of the strategy of acting tough and joking around was to not care in a passive way or give any thought to unfair treatment due to negative stereotypes about women, another part was to participate actively in the banter and make jokes in the same way that the men did. The girls said it was important to show that they could deal with banter in accordance with workplace norms and expectations. Being able to handle banter from male workers meant receiving comments without showing feelings of being insulted or becoming emotional, as well as giving quick replies and making jokes back to the men. A common way to deal with the banter was to treat the men in the same way that the men treated the girls.

> Belinda: I handle the banter like, well I treat them like they treat me. If they make a comment, I make a comment that's much worse and then you kind of start to laugh about it.

Encountering banter from male workers was something the girls were used to, and something that they had to learn in order to access tasks in the workplace. An important attribute for the girls to endure the pressure was to be strong in order to profile themselves as capable workers.

> Amanda: There's a lot of special treatment, like: 'Can you really handle that, are you strong enough?' And you don't get to prove it so you're just like 'Well yes, I can take care of myself'. But you just have to tell them off and then you get to take on the job yourself anyway.

Standing up for oneself was a way of acting tough, and sometimes it also included developing their own solution that served as a tool for breaking through the reluctant male culture. One girl described her longstanding efforts to gain acceptance from male workers as follows.

> Alice: It was mostly guys between 30 and 35, maybe up to 40, that had problems, but they didn't do anything, they just glowered and walked past me, didn't say hello. But that wasn't a problem, I don't take it personally.
> Researcher: But you said that you finally got the guys to say hello. How did you do that?
> Alice: I don't know, I always walked around and tried to smile a lot, simply trying to make them say hello, make them laugh a little, kind of letting go of that stiff feeling. So finally, it worked.

This girl also described that it required a great social effort on her part to get the male workers to simply greet her in the morning. Despite being ignored by the men, she continued to smile and show a happy face when meeting them. Eventually, she persuaded the men to greet her by using her gently humorous manner. It was important for the girls to be able to demonstrate that they could handle jokes and banter, to win appreciation and to be seen as a colleague in the work community.

7 Discussion

The findings of this article provide an insight into female vocational students' strategies for becoming part of a workplace community within male-dominated industrial work. As our findings suggest, the female students' agentic attitudes and actions created strategies to gain access to the workplace community and to position themselves as industrial workers. The findings highlight three specific strategies that the girls used: Acting like gender does not matter, acting like boys (not like drama queens), and acting tough and joking around. These strategies served as a basis for creating relationships and achieving acceptance that gave the girls access to the male-dominated community of practice (Paechter, 2003). The female students' active engagement in the male-dominated community implied a commitment to participate in a joint work activity (Wenger, 2010) to achieve a vocational identity for work in industrial vocations that they often found very attractive. Although the girls approached what they perceived as an attractive vocational identity, the strategies can also be understood as a response to distance themselves from traditional femininity in their bid to compensate for negative gender prejudice and seek equal opportunities as men (Wenger, 2010).

The strategy of acting like gender does not matter seemed to be a way to maintain gender neutrality as part of the formation of a vocational identity, despite the fact that the girls were treated differently. By not paying attention to gender issues or how structures and hierarchies of gender could affect them, they saw themselves as solely responsible for being accepted in the workplace community. The girls' self-responsibility and neutralisation of gender to become part of the masculine workplace community seems to be in line with an individualistic and genderless discourse found in previous research (Colley, 2006; Gustavsson & Fogelberg Eriksson, 2010; Lahemla, 2011). It was up to the girls to prove that they were suitable for the vocation. Therefore, the girls' own explanations repeatedly drifted towards gender not mattering in relation to the vocation, in order to gain access to tasks and guidance from experienced workers and to fit into the community of male workers. The girls downplayed gender issues and effects by saying: "Everybody is nice and treats me well", and "I am not excluded because I am a girl" (cf. Lahelma, 2011; Lappalainen, 2012). Nevertheless, ambiguities were found in the girls' interview responses. They also talked about being exposed to unequal treatment that led to both advantages and disadvantages of being a girl in the

male-dominated workplace. One explanation for the ambiguity between showing a strategic attitude to fit in and their experiences of actual treatment may be that conversations about gender were not an accepted issue of the male-dominated working culture (Korvajärvi, 2002; Risberg, 2004); a masculine community of practice (Paechter, 2003) in which the girls actively tried to become full participants and form a vocational identity (Lave & Wenger, 1991; Wenger, 2010) as industrial workers. The strategy of acting like gender does not matter seems to contradict the other two strategies, which focus on behaving like men in order to become accepted in the community of practice, but all three strategies seem to operate in parallel. The difference is that the strategy of acting like gender does not matter is about not engaging in gender issues but perceiving oneself as a worker rather than a girl, and thus adopting the discourse of genderless gender (Lahelma, 2011; Lappalainen, 2012). On the one hand, this implies that the girls' gender is irrelevant to the work. On the other hand, it contradicts their experiences of being treated differently to male workers.

It has been shown that masculine attitudes may force female students in male-dominated vocations to behave like boys (Ely, 1995; Korp, 2011). In contrast to previous research, the girls in this study often felt comfortable with the masculine attitudes in the workplace community. Choosing to act like boys and not like drama queens was the female students' second strategy, suggesting that they appreciated the masculine environment. A drama queen was an image or identity attributed to other girls, not to girls who participated in the industrial programme. Expressing not being a drama queen served as a way to disconnect oneself from the traditionally feminine way of being (Paechter, 2006b) and doing something that was seen as atypically female (Paola Sevilla et al., 2019). The girls actively positioned themselves as girls who preferred to work in the industrial sector, getting dirty and not complaining about arduous tasks. Working in such circumstances and together with men made them feel freer and more relaxed than in female contexts. The girls were often proud and found freedom in their future vocational identity. It can therefore be said that they also moved their position closer to becoming an industrial worker (cf. Ledman et al., 2020).

Industrial work was valued by the girls as an attractive job. It therefore also became important to the girls to prove that they could tolerate jokes from male workers and cope with the pressure of acting tough in order to break through the male-dominated workplace culture. This type of strategy was apparent in some of the female students' concrete suggestions for finding their own solutions to prove themselves worthy of male workers' acceptance. They were not allowed to present themselves in the role of an intimidated girl (Tanggaard, 2006). Yet, the findings indicate that the girls more or less consciously struggled against gender structures and prejudices. Gaining acceptance in the male-dominated workplace community sometimes meant a long journey for the girls, because it involved challenging established female stereotypes such as what women could do and also questioning dominant male ideals. Girls were often required to participating in male banter and humour, which also has

been identified in other male-dominated vocational programmes (Kontio & Evaldsson, 2015; Korp, 2011). Female students who met the requirements to participate in banter seemed to gain access to the repertoire of tools and guidance needed to learn the vocation. As they were often the only girl in the workplace, they had to find out for themselves what it was like to be a woman in this masculine workplace community (Paechter, 2003). It was up to them to negotiate the vocational identity (Wenger, 2010), and they therefore also developed their personal agency to make a difference and become a participant to count on in the workplace.

8 Conclusions and Implications

Forming a vocational identity as an industrial worker required the female students to meet challenges and fulfil different expectations due to their gender as part of their workplace-based learning. In order to do so, the girls mostly relied on their individual agency while interacting with others in the male-dominated workplace. As we have shown, the girls' strategies were part of and tied to a complex vocational identity formation process that involved contradictory requirements. By taking individual responsibility, the girls identified relevant information for becoming industrial workers and choosing to act like boys. They saw no problem with being a girl, but they struggled with implicit, diffuse and hidden gender structures and prejudices in the male-dominated workplace. Following these findings, the conclusion is that the girls seemed to form a 'gendered vocational identity'. This means that the vocational identity formation of the female students can be seen as a double process, in which vocational and gender identities were formed simultaneously and in parallel, interlaced within the male-dominated workplace. The girls strived for what they perceived to be an attractive vocational identity as industrial workers that were far removed from a typically feminine way of being. The male-dominated workplace community provided the girls with an alternative way of being a girl. Nevertheless, it could be hard for them to figure out what it meant to be a female industrial worker, but with the help of their strategies they actively negotiated the gendered vocational identities for changing their conditions as women in the workplace. In accordance with the girls' self-responsibility, the conditions they could change seemed to affect only themselves. The girls could not confront the general stereotype of women not being able to do industrial work – even though they behaved like men, leading to the reproduction of gender roles.

However, it is important to remember that these girls enrolled on the industrial programme were attracted by working in vocations in the industrial sector. Therefore, one of the implications of the findings of this study is that it is important for providers of vocational education to focus on learning conditions in local workplace environment in which students carry out their workplace-based learning. This requires engaging in a dialogue with industrial companies about how to create inclusive workplace environments that attract girls just as

much as boys. One way to attract more girls into the male-dominated industrial sector can be to change attitudes to women working in manufacturing and process industries. Perhaps this is an overly extensive suggestion that requires measures to address gender segregation in the labour market in general, and in the male-dominated industrial sector in particular. A less modest suggestion is that girls on the industrial programme can be important female role models who can inspire by showing opportunities for girls who are considering working in a male-dominated industrial vocation.

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References

Acker, J. (2006). Inequality regimes: Gender, class, and race in organizations. *Gender & Society*, *20*(4), 441–464. https://doi.org/10.1177%2F0891243206289499

Armishaw, D. D. (2007). Vocational identity: It's about working at becoming. *College Quarterly*, *10*(2), 1–13.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Colley, H. (2006). Learning to labour with feeling: Class, gender and emotion in childcare education and training. *Contemporary Issues in Early Childhood*, *7*(1), 15–29. https://doi.org/10.2304%2Fciec.2006.7.1.15

Ely, R. J. (1995). The power in demography: Women's social constructions of gender identity at work. *Academy of Management journal*, *38*(3), 589–634. https://doi.org/10.5465/256740

Evans, K., Guile, D., Harris, J., & Allan, H. (2010). Putting knowledge to work: A new approach. *Nurse Education Today*, *30*(3), 245–251. https://doi.org/10.1016/j.nedt.2009.10.014

Ferm, L., Persson Thunqvist, D., Svensson, L., & Gustavsson, M. (2018). Students' strategies for learning identities as industrial workers in a Swedish upper secondary school VET programme. *Journal of Vocational Education & Training*, *70*(1), 66–84. https://doi.org/10.1080/13636820.2017.1394357

Fuller, A., & Unwin, L. (2003). Learning as apprentices in the contemporary UK workplace: Creating and managing expansive and restrictive participation. *Journal of Education and Work*, *16*(4), 407–426. https://doi.org/10.1080/1363908032000093012

Gustavsson, M., & Fogelberg Eriksson, A. (2010). Gendered learning environments in managerial work. *Studies in the Education of Adults*, *42*(2), 141–155. https://doi.org/10.1080/02660830.2010.11661594

Helms Jørgensen, C. (2013). The role and meaning of vocations in the transition from education to work. *International Journal of Training Research*, *11*(2), 166–183. https://doi.org/10.5172/ijtr.2013.11.2.166

Klotz, V. K., Billett, S., & Winther, E. (2014). Promoting workforce excellence: Formation and relevance of vocational identity for vocational educational training. *Empirical Research in Vocational Education and Training*, *6*(1), 1–20. https://doi.org/10.1186/s40461-014-0006-0

Kontio, J., & Evaldsson, A. C. (2015). Last year we used to call it a man's hammer: (Un)doing masculinity in everyday use of working tools within vocational education. *International Journal for Masculinity Studies*, *10*(1), 20–38. https://doi.org/10.1080/18902138.2015.1013343

Korp, H. (2011). What counts as being smart around here? The performance of smartness and masculinity in vocational upper secondary education. *Education, Citizenship and Social Justice*, *6*(1), 21–37. https://doi.org/10.1177%2F1746197910397909

Korvajärvi, P. I. (2002). Locating gender neutrality in formal and informal aspects of organizational cultures. *Culture and Organization*, *8*(2), 101–115. https://doi.org/10.1080/14759550212838

Lahelma, E. (2011). Gender awareness in Finnish teacher education: An impossible mission? *Education Inquiry*, *2*(2), 263–276. https://doi.org/10.3402/edui.v2i2.21979

Lappalainen, S., Lahelma, E., Pehkonen, L., & Isopahkala-Bouret, U. (2012). Gender neutralities, dichotomies and hidden inequalities: Analysis of vocational teachers' reflections on gender in the profession. *Vocations and Learning*, *5*(3), 297–311. https://doi.org/10.1007/s12186-012-9082-0

Lave, J., & Wenger, E. (1991). Situated learning: Legitimate peripheral participation. Cambridge University Press.

Ledman, K., Nylund, M., Rönnlund, M., & Rosvall, P. Å. (2020). Being and becoming a female student and worker in gendered processes of vocational education and training. *Gender and Education*, 1–17. https://doi.org/10.1080/09540253.2020.1815659

Paechter, C. (2003). Masculinities and femininities as communities of practice. *Women's Studies International Forum 26*(1), 69–77. https://doi.org/10.1016/S0277-5395(02)00356-4

Paechter, C. (2006a). Power, knowledge and embodiment in communities of sex/gender practice. *Women's Studies International Forum* 29(1), 13–26. https://doi.org/10.1016/j.wsif.2005.10.003

Paechter, C. (2006b). Masculine femininities/feminine masculinities: Power, identities and gender. *Gender and Education*, *18*(3), 253–263. https://doi.org/10.1080/09540250600667785

Paola Sevilla, M., Sepúlveda, L., & José Valdebenito, M. (2019). Gender differences production in secondary technical vocational education. *Pensamiento Educativo*, *56*(1), 1–17.

Pleasant, E. (2019). Dirty work: Cultural iconography and working-class pride in industrial apprenticeships. *The British Journal of Sociology*, *70*(5), 2116–2132. https://doi.org/10.1111/1468-4446.12703

Risberg, G. (2004). *"I am solely a professional–neutral and genderless": On gender bias and gender awareness in the medical profession*. (Doctoral dissertation).

Struthers, K., & Strachan, G. (2019). Attracting women into male-dominated trades: Views of young women in Australia. *International Journal for Research in Vocational Education and Training*, *6*(1), 1–19. https://doi.org/10.13152/IJRVET.6.1.1

Swedish National Agency for Education. (2020). *Monitoring upper secondary school 2020* [Uppföljning av gymnasieskolan 2020]. https://www.skolverket.se/getFile?file=6585

Tanggaard, L. (2006). Situating gendered learning in the workplace. *Journal of Workplace Learning*, 18(4), 220–234. https://doi.org/10.1108/13665620610665827

Wenger-Trayner, E., & Wenger-Trayner, B. (2015). Learning in a landscape of practice. A framework. In E. Wenger-Trayner, M. Fenton-O'Creevy, S. Hutchinson, C. Kubiak, & B. Wenger-Trayner (Eds.), *Learning in a landscape of practice. Boundaries, identity, and knowledgeability in practice-based learning* (pp. 13–29). Routledge.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press.

Wenger, E. (2010). Conceptual tools for CoPs as social learning systems: Boundaries, identity, trajectories and participation. In C. Blackmore (Ed.), *Social learning systems and communities of practice* (pp. 125–143). Springer.

West, C., & Zimmerman, D. H. (1987). Doing gender. *Gender & Society*, *1*(2), 125–151.

Wetherell, M., Stiven, H., & Potter, J. (1987). Unequal egalitarianism: A preliminary study of discourses concerning gender and employment opportunities. *British journal of social psychology*, *26*(1), 59-71. https://doi.org/10.1111/j.2044-8309.1987.tb00761.x

Åberg, M., & Hedlin, M. (2015). Happy objects, happy men? Affect and materiality in vocational training. *Gender and Education*, *27*(5), 523–538. https://doi.org/10.1080/09540253.2015.1069797

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International Vocational Education and Training Research: An Introduction to the Special Issue

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Abstract

The seven articles in this special issue represent a wide range of international comparative and review studies by international research teams from China, Germany, India, Russia, Switzerland and Mexico. The presented projects are part of the national program "Research on the Internationalisation of Vocational Education and Training", funded by the German Federal Ministry of Education and Research (BMBF).

An adapted version of Urie Bronfenbrenner's ecological systems theory forms the conceptual framework of the special issue. The four system levels (micro, meso, exo and macro) are addressed by one article each. The article on the microsystem level focuses on the intended and implemented curricula in a cross-country comparison of China and Russia. The article on the mesosystem level aims at the development of a quality management model for vocational education and training (VET) institutions in India. At the exolevel, the regional structures of the education and employment systems in Mexico, particularly the cooperation between schools and companies in the hotel industry, are investigated. At the macrosystem level, the social representation of non-academic labour in Mexico is examined in terms of cultural artefacts. Furthermore, three overarching review studies systematise relevant research developments and approaches. The topics of the three review studies are European VET policy, transfer of VET and VET research. The scope ranges from the development of a comparative research tool to a summary analysis of over 5,000 individual publications.

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Given the broad scope and heterogeneity of the findings, a summative conclusion would hardly be appropriate. Nevertheless, with regard to the model of the 'triadic conception of purposes in comparative VET research' that represents a heuristic for describing the purposes of international VET research, we conclude with an emphasis on a need of more criticality. In this context, one finding can be pointed out as an example: One review study found that most studies (here, with reference to VET transfer) refer to the recipient country without a comparative perspective. Thus, there is a clear demand for more comparative research following a critical-reflective approach.

Keywords: Vocational Education and Training, Bronfenbrenner Model, Curriculum, Quality, Cooperation, Culture, Artefacts, Literature Review, European VET Policy, Transfer of VET, VET Research

Introduction

In contrast to general and higher education, which have (at least in parts) comparable curricula as well as comparable structures and institutions across countries and cultures, vocational education and training (VET) is often strongly regionally and nationally oriented, with diverse histories, self-conceptions, objectives, curricula, structures and practices. Internationally, VET is a parcelled field. This situation might explain the fact that no research network representing the academic discipline of VET has yet to be established at a truly international level. This could also be a reason why studies on VET are predominantly local, regional or national in their focus and scope. In comparison, other academic disciplines, such as medicine or economics, have a completely different and much more self-evident approach to the dimension of internationalisation. Since VET is linked to the world of work, however, this state of affairs is remarkable, as companies and labour markets are no longer primarily national but rather globally organised.

Whilst this noteworthy diversity poses a problem in developing a coherent international understanding and conceptualisation of VET, such heterogeneity has facilitated the emergence of an intensive form of VET cooperation in the field of development aid over the last 70 years. The predominantly asymmetrical cooperation usually occurs from North (donor) to South (recipient) or from industrialised to developing countries. Almost at the same time, a second type of predominantly symmetrical VET cooperation with a regional focus has emerged. An example of this type of cooperation is CINTERFOR in Uruguay, the Inter-American Centre for Knowledge Development in Vocational Training, founded by the International Labour Organisation in 1963. Besides others, one major difference characterises these two forms of cooperation: Whilst donor-oriented programmes usually work on the basis of temporary projects (with all the accompanying challenges, such as the lack of possibilities to

work in a long-term and sustainable way as well as to accumulate knowledge, expertise and experience), the cooperation-oriented CINTERFOR approach is institutionalised, i.e., it offers the possibility of creating a regional network based on long-term cooperation, trust and mutual learning.

In VET cooperation, "Germany is currently the world's largest bilateral donor in the TVET sector. The German official development assistance (ODA) allocated for TVET (€ 231 million in 2017) even exceeded the corresponding contributions of the European Union and the World Bank" (Edel, 2020, p. 291). Whilst the German government has invested considerable resources in VET cooperation since the 1950's, interest in its effectiveness (detected by evaluation) and in gaining knowledge about the cause–effect relationships (detected by research) has been extremely limited.

The first selective evaluations did not begin until the 1990s (Stockmann, 1992). At the same time, VET cooperation had rapidly declined in the realm of political interest. Since the dissolution of the former VET Cooperation Department in the Ministry of Economic Development and Cooperation in the 1990s, VET cooperation has been considered only as a complementary instrument of economic development (Wolf, 2009). The reactivation of the commitment to VET cooperation after two decades can be attributed to two factors: (1) The financial, economic and social crises that started in 2007 and the international appreciation of the German VET system in this context[1] and (2) the cooperation of the Ministry of Education and Research and the Ministry of Economic Development and Cooperation.

With such renewed commitment (thus leading to the actual status of 'leading bilateral donor'), VET research was declared and established in 2013 as the fifth guiding principle of the German international VET cooperation. The first four principles are as follows: (1) Joint responsibility of the state, industry and social partners; (2) learning in the work process; (3) acceptance of national occupational, training and examination standards; and (4) qualified training personnel in companies and vocational schools. The fifth principle includes institutionalised VET as well as labour market research and consultation on VET. Within the framework of international VET cooperation and with reference to these five principles, the German government thereby supported other countries in integrating elements of practice-oriented or apprenticeship-oriented VET into their respective systems (BMBF, 2013, 2019).

This new strategy employed by the German federal government has enabled a funding programme that promotes VET research at an international level. The programme "Research on the Internationalisation of Vocational Training", funded by the German Federal Ministry of Education and Research (BMBF), serves to strengthen and expand institutionalised VET research in Germany and abroad as an instrument for international VET cooperation. In particular, this funding programme aims to (1) sustainably strengthen the expertise of

1 For example, the Organization for Economic Cooperation and Development (OECD) noted that youth unemployment "certainly tends to be less often a problem (relative to adult unemployment) in countries like Germany with strong 'dual' apprenticeship systems." (OECD, 2010, p. 34).

universities and other research institutions in international VET research, (2) integrate this expertise more closely into the BMBF's international VET cooperation and make it accessible to foreign partners via established structures and, (3) support reform processes abroad in the direction of more practice-oriented initial and continuing VET (BMBF, 2017). The first funded projects in this programme began in 2019. The articles in this special issue originates from this research programme.

Conceptual Framework

To structure the contributions of this special issue, we use an adapted version of Urie Bronfenbrenner's ecological systems theory. Bronfenbrenner published the first systematic exposition of his theory in the 1970's and further refined and developed it in the following years (e.g. Bronfenbrenner, 1979; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006). A central assumption of this theory is that a system consists of nested subsystems that are "each inside the next, like a set of Russian dolls. At the innermost level is the immediate setting containing the developing person. This can be the home, the classroom, or as often happens for research purposes–the laboratory or the testing room." (Bronfenbrenner, 1979, p. 3)

Bronfenbrenner (1979) calls this innermost level the "microsystem", which is "a pattern of activities, roles, and interpersonal relations experienced by the developing person in a given setting with particular physical and material characteristics" (p. 22). Within the microsystem, processes that are more or less effective can be distinguished in terms of development and learning. In effective processes, which are also called 'proximal processes', interactions "occur on a fairly regular basis over extended periods of time" (Bronfenbrenner & Morris, 2006, p. 797). Learning settings are such proximal processes. Two types of outcomes can then be distinguished, namely, competence and dysfunction:

> The term 'dysfunction' refers to the recurrent manifestation of difficulties on the part of the developing person in maintaining control and integration of behaviour across situations, whereas competence is defined as the demonstrated acquisition and further development of knowledge and skills–whether intellectual, physical, socioemotional, or a combination of them. (Bronfenbrenner & Morris, 2006, p. 803).

Proximal processes enhance individual competences and reduce degrees of dysfunction. The next level, the mesosystem, is "a system of microsystems" (Bronfenbrenner, 1979, p. 25). A mesosystem is established based on interrelations between two or more immediate settings in which a person is an active participant. Participation in immediate settings (e.g. school and workplace) emphasises embeddedness and thus the concept of role (e.g. learner and worker), which is now visible in the diversity of institutional contexts. According to Bronfen-

brenner (1979), "The developmental potential of participation in multiple settings will vary directly with the ease and extent of two-way communication between those settings" (p. 216).

The next level, the exosystem, consists of "settings that do not involve the developing person as an active participant but in which events occur that affect, or are affected by, what happens in that setting" (Bronfenbrenner, 1979, p. 237). Finally, the macrosystem contains the belief system or ideology of the given system levels (micro, meso and exo) and the integrational consistency. These generalised patterns that comprise the macrosystem represent the "manifestation of overarching patterns of ideology and organisation of the social institutions common to a particular culture or subculture" (Bronfenbrenner, 1979, p. 8).

The basic assumption of Bronfenbrenner's theory is that people develop whilst interacting with their environment. The approach, which has been transferred to German VET research (e.g. Kell, 1990), has been employed ever since (e.g. Zlatkin-Troitschanskaia, 2005; Lange, 2019). Here, we refer to Kell's interpretation from 1995. Kell distinguishes between work processes that are oriented towards the development and change of the environment and learning processes that are oriented towards the development and change of the self: "This separation and demarcation presupposes that there are (at least) two differently structured (organised) microsystems in which persons (can) develop differently: The workplace and the learning place. Both 'places' as specific environments stand in different (topologically nested) systems (environments)" (Kell, 1995, p. 376, translation by the authors).

Following Kell, teaching and learning arrangements can be classified as e.g. problem- and project-based learning, collaborative online learning and microlearning. Clustered arrangements then form the microsystem 'learning place', which can be located in a school or at a company. Workplaces are also never independently of their contexts but are elements of an organisation based on the division of labour. Moreover, workplaces are interconnected structurally (hierarchy) and procedurally (work process) and form the integrated microsystem of a company. These microsystems can be institutionally integrated into different mesosystems. For example, a microsystem 'learning place' can be located in a school or in a company. Hence, it is crucial that the conditions of the mesosystem influence the conditions of the microsystem without necessarily determining them. For example, a training centre in a company can be integrated into the production system or also define its identity at a distance from and in contrast to the production system.

Interactions also exist between the higher-level exosystem (e.g. the employment system) and the mesosystem. The *Berufsprinzip* (occupational principle) in Germany can serve as an example of these interactions. In particular, the orientation of VET in Germany at the mesosystem level towards the principle of *Berufe* (professions) is possible because the employment system at the exosystem is guided by this principle (Kell, 1995, pp. 376–382). Meanwhile, Streeck (2011) discussed other structuring principles of the employment system, such as tripartite cooperation or the social prestige of skilled workers. In the 'learning processes' pillar,

the education system forms the relevant context of the corresponding institutions. Examples of these structuring principles include the permeability between vocational and academic education, the share of general education in vocational education or the equivalence of vocational education on the one hand and higher education on the other.

At this point, it becomes evident how strongly the macrosystem affects the structuring of the exosystem level (and the levels below): E.g., the German dual apprenticeship system is a structure (on the exosystem level) and a historically grown cultural pattern (on the macrosystem level). Hence, the continued functioning of the dual system is based on both the belief in this system and the established social structures. Thus, if the social structures are removed, such as when a German company establishes a subsidiary abroad, but the belief system is retained because e.g. the CEO in the subsidiary is a German, then there is a higher likelihood that the company will implement a dual system abroad, although it will be a modified one (Gessler, 2017).

Figure 1 shows the conceptual framework and the articles.

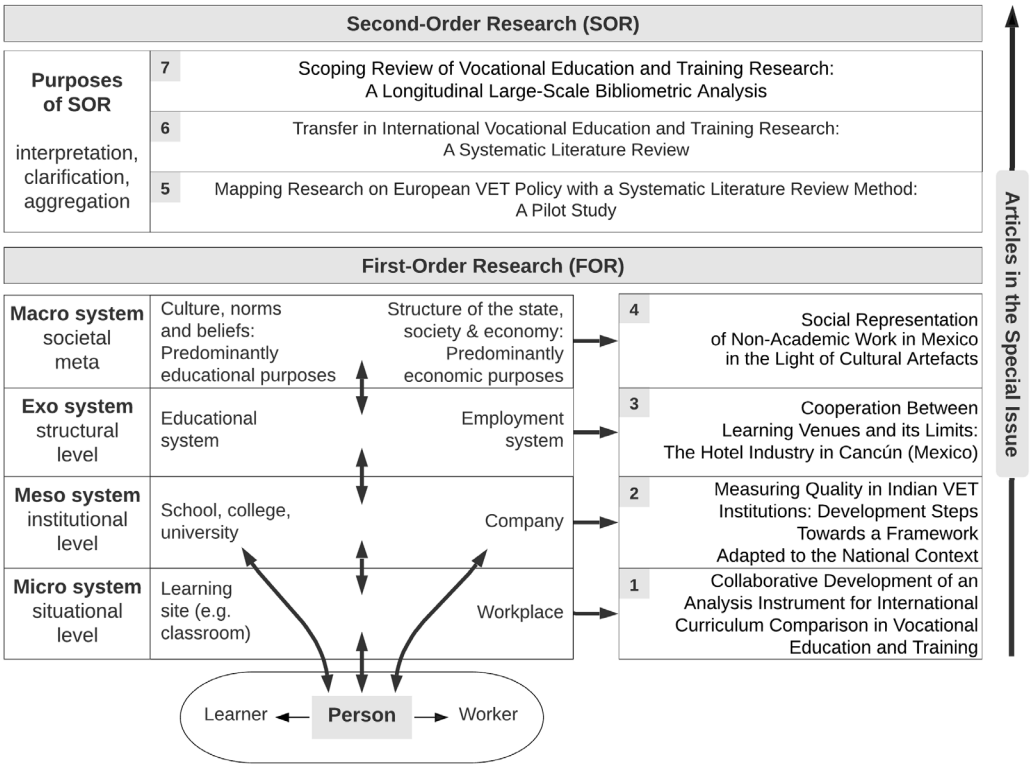


Figure 1: Structure and Articles of the Special Issue, based on Kell (1995, p. 377)

On the basis of this outlined conceptual framework, we structured the first four articles. To this foundation based on first-order research, we added three articles focussed on second-order research (literature reviews), with the goal of integrative knowledge interpretation, clarification and aggregation in a particular area of first-order research.

The Articles of the Special Issue

This section briefly introduces the seven contributions to the special issue, which will be published successively until the end of 2021. We begin with the first-order research and the four articles on the micro-, meso-, exo- and macrosystem levels.

Microsystem Level

International curriculum comparison in vocational education and training: A collaborative development of an analysis instrument by Pujun Chen, Anastasia Goncharova, Matthias Pilz, Dietmar Frommberger, Junmin Li, Olga Romanova and Yueru Lin:

The article focusses on the curriculum – a concept that is less well-defined than might be expected. Hence, the different meanings of a curriculum need to be distinguished from one another. In their analysis, the authors referred to a theoretical framework introduced by Van den Akker et al. (2010) and subsequently distinguished between an intended and an implemented curriculum. The intended curriculum can be seen as an element of the meso system level and thus acts as a mediator between the teaching/learning activities of the micro system level and the structures of the exosystem level (What should be learned and how should the output be measured?). In contrast, the implemented curriculum maps the actual teaching/learning activities at the micro level (The 'curriculum in action' – What is taught and learned and what outputs are created?).

The (intended and implemented) curriculum approach can be thought of and implemented in different ways. The authors used a framing device introduced by Sturing et al. (2011), called the 'Revised Model of Comprehensive Competence-Based Vocational Education'. Using this framing device facilitated their theoretical–conceptual comparison of the curricula in Russia and China. Then, the stages 'Building the Analysis Framework' and 'dapting the Analysis Framework' (with the sub-steps Operationalisation of Categories Using Additional Literature Research, Data-Driven Adjustment of Categories, Reorganising Categories and Adding Categories Inductively) enabled the authors to trace step-by-step how the analytical tool to compare intended and implemented competence-based curricula in China and Russia was developed.

Mesosystem Level

Measuring quality in Indian VET institutions: Development steps towards a framework adapted to the national context by Muthuveeran Ramasamy, Julia Regel, Harshil Sharma, Anjana Rajagopalan and Matthias Pilz:

The four major modes of the VET system in India consist of private training institutes, apprenticeship training, secondary, higher secondary schools and polytechnic colleges, and industrial training institutes (ITIs). The VET system in the country has grown significantly in the last 15 years. In particular, IITs have grown from less than 2,000 facilities in 2007 to almost 15,000 facilities in 2020. This rapid quantitative expansion, however, has been accompanied by negative feedback from the labour market (e.g. skills mismatch), thus leading to the problem of how the quality of VET institutions can be measured, controlled and improved. The authors, an Indian–German team of researchers, used a design-based research approach to investigate 44 mostly Asian and indigenous Indian quality models, of which 14 were selected for further analysis. Then, on the basis of over 400 indicators and criteria, the authors cross-referenced process dimensions (Input, Process, Output, Outcome) and content dimensions (Institutional Sphere and Context, Personnel, Educational Planning, Provision and Assessment, Learning and Teaching, Leadership and School Management, Industry Linkage and Learner Achievements), resulting in a matrix. In addition to model development, the model was adapted to the national context, a process that played a central role in the study. Culture and educational institutions are closely interwoven elements, which is why cultural conditions are particularly necessary when designing educational institutions. In this sense, cultural patterns ground normative decisions. As the society in India is characterised by high inequality and exclusion, the aspect of 'Inclusion, Access and Equity' has emerged as a central quality aspect of the model.

Exosystem Level

Cooperation between learning venues and its limits: The hotel industry in Cancún (Mexico) by Beke Vogelsang, Natascha Röhrer, Martina Fuchs and Matthias Pilz:

Cancún is a tourist hotspot in Mexico with about 1,000 hotels and over six million tourists every year. The hotel industry, therefore, has significant regional and national importance as an employer and economic factor. Although the hotel industry is a major employer, this industry is not a driver for the development of high-quality jobs for highly qualified employees due to low average wages. This circumstance, together with the high level of local competition, has led to a great demand for skilled workers. At the same time, this has led to a staffing shortage, especially at the middle level, including receptionists and service personnel. Due

to the existing demand, the hotel industry is participating in a government initiative aimed at improving VET within the legal framework of the 'Modelo Mexicano de Formación Dual (MMFD)' by intensifying cooperation between educational institutions and the industry. A central research question and problem of VET research arises precisely from this focus: How can cooperation between two institutions and their actors succeed if they pursue different goals based on their interests and functions (training versus profit)?

On the basis of a theoretical framework proposed by Billet et al. (2007), the authors of this article conducted qualitative interviews to examine the principles of successful cooperation. Their analysis focussed on the following three principles: building and maintaining shared purposes and goals, building and maintaining relations with partners and building and maintaining partnership governance and leadership.

Macrosystem Level

Social representation of non-academic work in Mexico in the light of cultural artefacts by Ute Clement, Paola García Fuentes, Stefan Gold, Claudia Hunink and Lydia Raesfeld:

This contribution is also focused on Mexico and is linked directly to the contribution of Vogelsang et al. (2021) at the exosystem level. The term 'non-academic work' was used in this article for a broad field of activities (e.g. agriculture or industrial activities) requiring competences not acquired at the university. Even though such non-academic work forms the backbone of any economy and society, it is often considered in Mexico (and in other countries) as something deficient and inferior, especially when compared to academic work. This perception is a historically and culturally shaped social construct that is very powerful and influences the education and employment systems equally.

Certainly, there is consensus in this general form of description. The difficulties arise as soon as deeper questions are asked (e.g. What exactly is the social representation of non-academic work for (young) people in Mexico?). For their analysis, the authors used the theoretical framework model by Abric (1993), who distinguished between stable and rigid core elements and unstable and fluid peripheral elements. Social representations are shaped by human actions in artefacts and thus become visible; in turn, these artefacts shape social representations and thus become effective. This reciprocity between social representations and artefacts makes it possible to capture the social representations that are influenced by them via the analysis of artefacts. In analysing and presenting the results, the authors considered three categories in more detail: Competencies (e.g. Which knowledge does the working person show?), Habitus (e.g. What is the working person proud of?) and Working Conditions (e.g. Which context conditions are visible?).

The following three articles are review studies considered as second-order research. Here, we refer to the definition of literature reviews as "systematic syntheses of previous work around a particular topic" (Card, 2010, p. 725).

Review Study: European VET Policy

Mapping research on European VET policy with a systematic literature review method: A pilot study by Ianina Scheuch, Sandra Bohlinger, Anne Bieß and Hoang Long Nguyen:

European VET policy is a heterogeneous field of knowledge that is difficult to delineate. This article has two aims: (1) To test the extent to which the method of a systematic review is suitable for use in such a complex research field, and (2) to assess the application of the method to systematise and measure the field of knowledge, even if the results may not be conclusive. As a methodological framework, the authors used the approach of Gessler and Siemer (2020) with the following four phases: (1) Definition of the scope, (2) data selection, (3) data processing and (4) data reporting. The search criteria are deliberately narrow. In particular, the search is for a combination of 'VET' or 'vocational education and training' in combination with 'polic*' or other suitable terms (e.g., 'governance').

The authors worked with curated databases (e.g. Scopus) and found 70 articles in English for the period 2000–2020 after screening. Of these, 30 studies remained after performing another round of screening and controlling eligibility, thus building the grounding of the analysis. After a count (e.g. articles published per journal), a matrix was developed to group the existing articles in terms of topics and methods. Three major clusters were distinguished: (1) Governance in European VET policy at the EU-system level, (2) European VET policy and cross-country comparisons in the EU and (3) European VET policy implementation at the national level. Finally, the authors reflected on their experiences in applying the review method during the four phases of the review. The authors' critical review thus applies an interpretative scheme that captures the method in combination with the topic.

Review Study: Transfer of VET

Transfer in international vocational education and training research: A systematic literature review by Miriam Toepper, Olga Zlatkin-Troitschanskaia and Carla Kühling-Thees:

The authors conducted a systematic review to examine the topic 'transfer of VET' from one place to another, which can include, e.g., ideas, concepts, structures and practices. The search terms used were combined with the term 'transfer', such as 'policy transfer', 'educational transfer' or 'transfer of training'. This demonstrates the diversity in which the term is being used in research. With the additional aim of including the transfer of the German dual system abroad

(e.g. the articles on Mexico in this special issue), the search terms 'German dual system' and 'dual apprenticeship' were also used.

The search yielded 230 German and English language studies published from 2010–2020. In addition to a database search, the 'snowball sampling technique' was also used. After abstract/full-text screening and application of the inclusion criteria, 40 studies were included in the analysis. These 40 articles were systematically analysed using the following criteria: (1) Aim of the study, (2) method, (3) sample, (4) countries involved and (5) reference. From these 40 studies, six studies were of a theoretical–conceptual nature. However, the methodological basis of the other empirical studies was not always ascertainable. For example, the research methods and samples were not always precisely described. The analysis was thus condensed with regard to the 'key challenges in VET transfer' and 'key success factors in VET transfer'. The authors concluded by reflecting on the limitations and formulating implications for future research. Notably, most studies are based on recipient countries or companies, which is why the authors recommend a greater focus on comparative transfer studies with different countries in the future.

Review Study: VET Research

Scoping review of vocational education and training research: A longitudinal large-scale bibliometric analysis by Michael Gessler, Christof Nägele and Barbara Stalder:

Large-scale scoping reviews or mapping reviews are still rare in VET research. Nevertheless, the first few systematic knowledge mapping approaches have already been introduced. For example, Bezerra et al. (2020) conducted a worldwide mapping of work-based learning research (period covered: All years, N=410). The current paper, meanwhile, has an even broader focus: VET research. Thus, 'work-based learning' was included as a search term. Alternative terms (e.g. 'skill formation' or 'technical education') were also considered because VET is a widely used but sometimes criticised and, therefore, sometimes substituted term (Dougherty & Lombardi, 2016).

The study deals with the research question: How has VET research evolved in the last decade? Within this broad scope, the authors concentrated on four aspects: the actors, the knowledge base, the major themes and the evolution of the themes in time. The search was limited to English-language and peer-reviewed articles published between 2011–2020. Finally, the authors obtained 5,487 articles, which they subsequently considered in the analysis. This study used bibliometric analysis, a technique that has increasingly been used as a tool and basis for monitoring the research content and performance of scientific disciplines. Various tools were used for different purposes, such as biblioshiny for bibliometrix, an R-tool for science mapping analysis (Aria & Cuccurullo, 2017) to perform descriptive bibliometric analysis and the software SciMat for mapping analysis within a longitudinal framework to identify major themes and the evolution of the themes in time (Cobo et al., 2012).

Conclusion

The model of the 'triadic conception of purposes in comparative VET research' (Evans 2020) represents a heuristic for describing the purposes of international VET research. In this model, two strands of research are linked: (i) International and intercultural comparative VET research, which focusses on mutual learning and exchange along the dimensions of similarity and difference, and (ii) development studies, which focus on a contextualised understanding of change and pursue concrete development goals, such as poverty reduction ('improvement'). These approaches have in common that they are based on the importance of understanding and communication as necessary conditions. Ultimately, international VET research differs from other fields of enquiry in the way it achieves 'criticality', which is at the centre of the triadic purpose. The triadic conception of the purposes of international comparative VET research is illustrated in Figure 2.

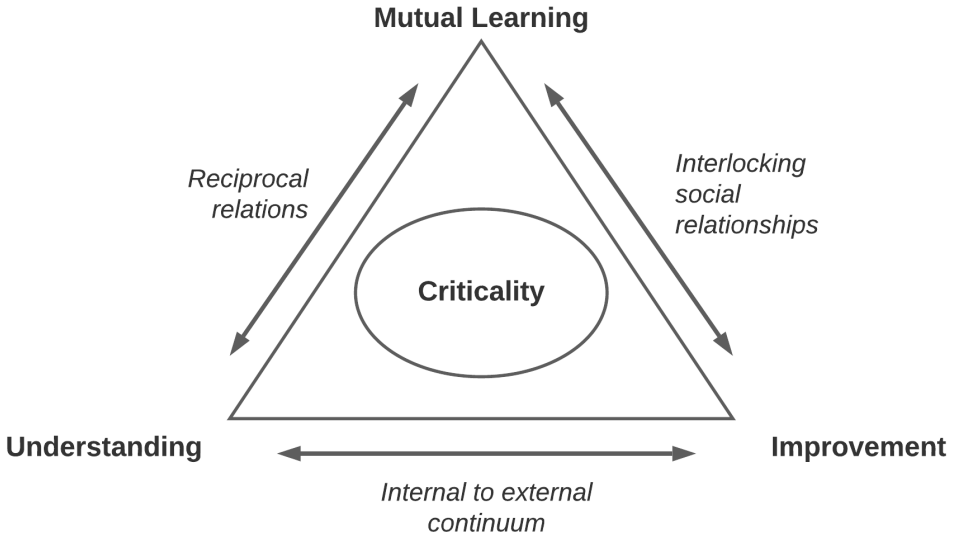


Figure 2: Triadic Conception of Purposes, Source: Evans (2020, p. 16)

While German international VET cooperation lacked any form of evaluation and reflection until the 1990s (see Introduction), from 1990-2010, international VET cooperation lacked something even more fundamental: Attention. Since the 2010s, political attention has returned, and with this turnaround, research funding has also begun again (with the first projects starting in 2019), and with research, criticality has finally returned. Criticality means countering uncritical assumptions of unilinear development perspectives and dominant discourses. It is the value of international VET research that lies precisely in this tension between existing interests and practices, as exemplarily illustrated in this special issue.

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References

Abric, J. C. (1993). Central system, peripheral system: Their functions and roles in the dynamics of social representations. *Papers on Social Representations*, *2*(2), 75–78. https://psr.iscte-iul.pt/index.php/PSR/article/view/126

Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, *11*(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007

Billett, S., Ovens, C., Clemans, A., & Seddon, T. (2007). Collaborative working and contested practices: Forming, developing and sustaining social partnerships in education. *Journal of Education Policy, 22*(6), 637–656.

BMBF Bundesinstitut für Bildung und Forschung. (2013). *Strategiepapier der Bundesregierung zur internationalen Berufsbildungszusammenarbeit aus einer Hand*. Deutscher Bundestag. https://www.govet.international/dokumente/pdf/ab12govet_Bundesanzeiger_Strategiepapier_der_Bundesregierung_zur_internationalen_Berufsbildungszusammenarbeit.pdf

BMBF Bundesinstitut für Bildung und Forschung. (2017). *Announcement regulations governing funding for research on the internationalization of vocational education and training (VET)*. https://www.berufsbildung-international.de/files/BEK_IBBF_eng.pdf

BMBF Bundesinstitut für Bildung und Forschung. (2019). *Strategie der Bundesregierung zur internationalen Berufsbildungszusammenarbeit*. https://www.bmbf.de/bmbf/shareddocs/downloads/files/137_19_strategie_bundesregierung.pdf?__blob=publicationFile&v=1

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Havard University Press.

Bronfenbrenner, U., & Evans, G. W. (2000). Developmental science in the 21st century: Emerging questions, theoretical models, research designs and empirical findings. *Social Development*, *9*(1), 115–125. https://doi.org/10.1111/1467-9507.00114

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner & W. Damon (Eds.), *Handbook of child psychology: Theoretical models of human development* (pp. 793–828). Wiley. https://doi.org/10.1002/9780470147658.chpsy0114

Card, N. A. (2010). Literature review. In N. J. Salkind (Ed.), *Encyclopedia of Research Design* (pp. 725–728). Sage.

Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2012). SciMAT: A new science mapping analysis software tool. *Journal of the American Society for Information Science and Technology*, *63*(8), 1609–1630. https://doi.org/10.1002/asi.22688

Dougherty, S. M., & Lombardi, A. R. (2016). From vocational education to career readiness: The ongoing work of linking education and the labor market. *Review of Research in Education*, *40*(1), 326–355. https://doi.org/10.3102/0091732X16678602

Edel, M. (2020). Build4Skills, TVET, and infrastructure – An innovative initiative. In B. Panth & R. Maclean (Eds.), *Anticipating and preparing for emerging skills and jobs* (pp. 291–296). Springer. https://doi.org/10.1007/978-981-15-7018-6_35

Evans, K. (2020). Comparative vocational education and training research: What purposes does it serve? In M. Pilz & J. Li (Eds.), *Comparative vocational education research: Enduring challenges and new ways forward* (pp. 3–19). Springer. https://doi.org/10.1007/978-3-658-29924-8_1

Gessler, M. (2017). Educational transfer as transformation: A case study about the emergence and implementation of dual apprenticeship structures in a German automotive transplant in the United States. *Vocations and Learning*, *10*(1), 71–99. https://doi.org/10.1007/s12186-016-9161-8

Gessler, M., & Siemer, C. (2020). Umbrella review: Methodological review of reviews published in peer-reviewed journals with a substantial focus on vocational education and training research. *International Journal for Research in Vocational Education and Training*, *7*(1), 91–125. https://doi.org/10.13152/IJRVET.7.1.5

Kell, A. (1990). Lernen und Arbeiten. Zu einem berufspädagogischen Thema und seiner Forschungslage. *Berufsbildung in Wissenschaft und Praxis*, *19*(6), 15–20.

Kell, A. (1995). Organisation, Recht und Finanzierung der Berufsbildung. In R. Arnold, & A. Lipsmeier (Eds.), *Handbuch der Berufsbildung* (pp. 369–397). Leske + Budrich.

Lange, S. (2019). *Die Berufsausbildungseingangsphase: Anforderungen an Auszubildende und ihre Bewältigungsstrategien am Beispiel des Kfz-Mechatronikerhandwerks*. wbv Media GmbH & Co. KG. https://doi.org/10.3278/6004720w

OECD Organisation for Economic Co-operation and Development. (2010). *Learning for jobs: OECD reviews of vocational education and training*. Paris: OECD.

Stockmann, R. (1992). *Die Nachhaltigkeit von Entwicklungsprojekten: Eine Methode zur Evaluierung am Beispiel von Berufsbildungsprojekten*. Springer. https://link.springer.com/book/10.1007%2F978-3-322-93597-7

Streeck, W. (2011). Skills and politics: General and specific. MPIfG *Discussion Paper*, *11*(1). https://www.mpifg.de/pu/mpifg_dp/dp11-1.pdf

Sturing, L., Biemans, H. J. A., Mulder, M., & De Bruijn, E. (2011). The nature of study programmes in vocational education: Evaluation of the model for comprehensive competence-based vocational education in the Netherlands. *Vocations and Learning*, *4*(3), 191–210. https://doi.org/10.1007/s12186-011-9059-4

Van den Akker, J., Fasoglio, D., & Mulder, H. (2010). A curriculum perspective on plurilingual education. Council of Europe. https://rm.coe.int/16805a1e57

Wolf, S. (2009). *Berufsbildung und Kultur – Ein Beitrag zur Theorie der Berufsbildung in der Entwicklungszusammenarbeit*. TU Berlin. https://depositonce.tu-berlin.de/handle/11303/2421

Zlatkin-Troitschanskaia, O. (2005). *Dynamik und Stabilität in Berufsbildungssystemen – Eine theoretische und empirische Untersuchung von Transformationsprozessen am Beispiel Bulgariens und Litauens*. Peter Lang.

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International Curriculum Comparison in Vocational Education and Training: A Collaborative Development of an Analysis Instrument

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Abstract

Context: International comparative research on Vocational Education and Training (VET) is gaining importance, as global cooperation and mutual learning in VET grows. However, it is characterized by a high degree of complexity, due on one hand, to the heterogeneity of the VET sector, and on the other hand to the unique challenges of international comparisons. In addition, comparative research projects are increasingly conducted in the form of cross-border collaborations, which have their own particular organizational and methodological considerations, opportunities, and challenges. This paper presents an example of a cooperative research process, aimed at investigating the complex phenomenon of the competence-based approach in Russian and Chinese VET. In providing an example of developing an instrument for curriculum analysis and comparison, we discuss and reflect on the methodological and organizational peculiarities and challenges of the research process conducted collaboratively by an international team.

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Method: The instrument for analysis and comparison of curricular documents, was developed in an iterative multi-stage process, combining deductive and inductive steps. The embeddedness of the elements of a competence-based approach in curricular documents is investigated, using qualitative content analysis. To develop a coding frame, we started with a comprehensive partially systematic literature review of international, Russian and Chinese discourses on competence-based curricula. The frame was built on the selected model of competence-based education, and on accumulated results of the literature analysis of national discourses. Furthermore, during the first coding process, an iterative adaptation of the developed instrument took place.

Results: The result of this process was the development of an analysis instrument which, on the one hand, is well-adapted to each national context and, on the other hand, allows a comparison of results along the same dimensions of analysis, in our case, elements of the competence-based approach in curriculum.

Conclusion: Developing an analysis framework for a cross-cultural comparative investigation of such a diffuse and heterogeneous construct as the competence-based approach, can pose a methodological challenge for an international team of researchers. However, an effective application of own team resources such as proficiency in different languages, insider and outsider perspectives, along with continuous intensive communication and a flexible, iterative research process, allows development of a well-adapted analysis instrument for international comparison.

Keywords: International Comparative Research, Vocational Education and Training, VET, Competence-Based Education, Curriculum, Analysis Instrument

1 Introduction

The interest in the experience of other countries in the educational field has a long tradition; however, globalization has been continuously intensifying the pursuit of a more profound understanding of different education systems. Governments support and invest in development of various forms of international cooperation and partnerships in the educational fields, in order to exchange good practices, or bring their educational know-how to foreign markets (Lauterbach, 2003a; McDonald, 2012). Playing a crucial role in workforce preparation for the labor market and, therefore, in the country's economic prosperity, the sector of Vocational Education and Training (VET), as could be expected, is gaining a lot of interest as a sphere of cooperation and mutual learning. In light of these processes, the importance of comparative research on VET is growing (Lauterbach & Mitter, 2018). This research contributes to a deeper understanding of different VET approaches and systems, their functioning,

development, stakeholders, relationships to general and higher education and so forth, providing the necessary foundation for further international cooperation and research processes in the VET field, and valuable information for political decisions (Lauterbach, 2003a). In addition, one of the further intentions associated with comparative (VET) research is to gain lessons from successful practices abroad in order to improve own education system (Phillips, 2009).

The international VET field is far more heterogeneous than general education, often with very different organizational forms, curriculum approaches, constellations of involved actors and modes of regulation, around the world (Billett, 2011; Pilz & Li, 2020). The variety of terms used to describe this educational sector reflects this diversity, among which are *technical and vocational education and training, technical-vocational education, further education and training, vocational and technical education, or career and technical education* (MacKenzie & Polvere, 2009). In some national contexts, the field of VET is clearly defined, while in others, there is no clear distinction from other fields of education or spheres of workforce preparation (Grollmann, 2009). Fischer (2020) points out that terms representing comparable facts, can be missing in different national contexts, while in some cases, the same words can be used to define different elements of reality. Consequently, international comparative research in the field of VET is characterized by great complexity. Researchers face various methodological challenges and organizational problems, on one hand specific to international comparative educational studies and, on the other connected to the VET sector's described heterogeneity. Consequently, obtaining comprehensive, transparent and comparative research results, becomes more challenging when VET systems of different countries are addressed in the research (Pilz, 2012).

At the same time, some researchers point out that comparative VET research is still a relatively new (sub-)discipline, where conceptual and methodological approaches are not yet well developed (Evans, 2020; Lauterbach, 2003b; Lauterbach & Mitter, 1998; Pilz & Li, 2020). In this regard, Lauterbach (2018a) critically points out that there is still a tendency to classify different national systems of VET through judgmental ethnocentric perspective evaluation, with broad structuring criteria in comparative VET research. Such an isolated analysis of specific factors can lead to the creation and reinforcement of stereotypes. Frommberger (2000) underlines, that the value of international comparison lies not only in a simple juxtaposition of the national systems, based on the common denominator and production of the general conclusions valid and applicable across borders, but especially in the interesting findings resulting from the identification of differences (Frommberger, 2000). A cross-border exchange between researchers through the analysis process, particularly during the interpretation of results, should facilitate international comparison (Frommberger, 2000).

Against the background of Frommberger's considerations, in recent years a positive development in the organization of comparative investigations, which allows a more efficient

and fruitful exchange between researchers, can be identified. More and more comparative VET research projects are conducted cooperatively by research teams from different countries rather than by researchers from one state (Pilz et al., 2020). Methodological approaches of such studies are usually different. Combining different expertise, external and internal perspectives on VET systems or aspects thereof, benefits the quality of the research, and helps to overcome ethnocentric perspectives. However, the organizational, cultural and linguistic diversity in such teams usually requires a more complex research process, and has specific methodological implications.

In this paper, we present an example of the research process in international comparative research on VET, conducted cooperatively by a team of researchers from three different countries. Taking it as an example, in this paper we aim to describe and to reflect how, under the condition of great complexity of VET as a research subject, an analysis instrument can be cooperatively developed, which can be applied for an international comparative study and, at the same time, be nationally adapted. This paper will start with a presentation of the overall research context within which the presented analysis framework was developed. After, central theoretical concepts of the research will be outlined. Further, the development and adaptation process of the analysis framework will be presented. Finally, we will discuss the lessons we learned from our experience. Therefore, this paper contributes to discussion of the methodology of comparative research. The state of research into this topic as well as a presentation of the analysis results of the study are not within the scope of this paper.

2 Research Context

This paper presents a part of the comparative study conducted within an international research project on the competence-based approach in commercial VET. Within the framework of the project, five universities from China, Germany and Russia are participating in the research collaboration, which is: Conducting an international comparative study of the competence-based approach in commercial VET. In China and Russia, the competence-based approach has been introduced as part of the VET modernization policies in recent years. This research project aims to investigate whether the envisaged reform intentions are successfully incorporated in practice in both countries. Therefore, two central consecutive research questions of the whole research project were formulated:

1. Which elements of the competence-based approach are established in didactic-curricular planning of educational processes (*intended curriculum*, see Section 3)?

2. To what extent is this planning realized during teaching and learning processes in the classroom (*implemented curriculum*, see Section 3)?

The research results should contribute to a better understanding of the development and the implementation of competence-based approach in VET curricula in both countries. Based on these research results, recommendations for the further development of competence-based curricula will be elaborated.

In the context of the research project, the competence-based approach serves therefore as the *tertium comparationis* for comparing VET of China and Russia. *Tertium comparationis* refers to the similarity of different elements to be compared, and is considered a prerequisite for systematic comparison (Kosmützky et al., 2020; Parreira do Amaral, 2015; Raivola, 1985). Following the central research questions, the *meta tertium comparationis* is further divided into two sub-elements: (1) Embeddedness of the elements of the competence-based approach in VET curricular documents, and (2) implementation in teaching-learning processes in a classroom. Accordingly, the research processes are designed in two phases (see Figure 1).



Figure 1: Focus of Different Research Phases and Corresponding Methods

In the first research phase, the embeddedness of the elements of the competence-based approach in target curricular documents from both countries is analyzed and compared, by using a qualitative content analysis method, which is understood as a method for describing selected text meanings through a process of organizing information into categories related to the central research questions, and identifying themes or patterns (Bowen, 2009; Hsieh & Shannon, 2005; Kuckartz, 2014; Mayring, 2000; Schreier, 2014). Qualitative content analysis has proved to be a well-suited method for curriculum analysis in several studies (Pilz et al., 2016; Levander & Mikkola, 2009; Malekipour et al., 2017; Pilz & Li, 2012; Shkedi, 2009). It can be applied to various types of written texts and, therefore, is suitable for analyzing the intended curriculum in our research. The system of categories for the analysis of intended curriculum, was developed with a mixed approach combining both concept-driven categories and data-driven categories (Kuckartz, 2019).

The second research phase is dedicated to analysis of the implementation of the competence-based approach in teaching and learning processes, by using the methods of structured classroom observation, and interviews with the involved teachers in selected vocational schools in both countries. Classroom observation is seen as a common method in studies of teaching and learning practices, to explore the reality of what occurs in the classroom (Guo & Pilz, 2020; Wragg, 1999). Structured observation is especially suitable for studies with specific research questions or focus (Phellas et al., 2011), which in our case is the implementation of the competence-based approach. The categories developed in the first research phase are used to build the structured observation instrument, to scrutinize the actual implementation of those elements of the competence-based approach identified from the intended curriculum in real teaching and learning processes. Afterwards, the teachers involved are interviewed with the purpose of reflection on the observed teaching and learning processes, with reference to the competence-based approach. This paper is dedicated to the first phase of the research processes, focusing on developing the instrument for analysis and comparison of intended curriculum.

3 Theoretical Background

Two central concepts underlying our research should be briefly clarified.

3.1 Curriculum

The concept of curriculum is used as a theoretical basis for the question of planning and implementing educational processes. In the literature on curriculum theory, there is no common definition of curriculum. Referring to the complexity of the curriculum concept, Adamson and Morris (2014) describe curriculum as "multifaceted, operating at a variety of focal points and in diverse manifestations" (p. 310). The word *curriculum* originates from the Latin for a short running track (Adamson & Morris, 2014). A variety of curriculum concepts range from a very narrow understanding of curriculum, understood as normative documentation containing educational intentions (European Centre for the Development of Vocational Training, 2010), to vast conceptions, including various levels and representations. An example of the broad definitions is Model of Goodlad et al. (1979), which classifies the curriculum into six classes: Ideal curriculum, formal curriculum, perceived curriculum, operational curriculum, experienced curriculum, and attained curriculum. Van den Akker et al. (2010) proposed a simpler typology of curriculum representations by further developing the model of Goodlad et al. (1979). He distinguished between three broad curriculum representations: *Intended*, *implemented*, and *attained curriculum*. The International Bureau of Education of

the United Nations Educational, Scientific and Cultural Organization (IBE-UNESCO) also provides definitions of these three curriculum representations.

Among narrower definitions of curriculum, which describe certain aspects of education process, and broader definitions and typologies, covering various aspects of educational processes, experiences and outcomes, for our research we intended to select a curriculum concept which corresponds to the scope of our research question and at the same time which can be general enough to be used in a comparative study and be applied in different national contexts. The threefold classification of the curriculum is chosen as most applicable for our research, because the conceptualization of the first two levels closely covers the focus elements of our main research question, namely planning and implementing the educational processes in VET. More precisely, the definitions from IBE-UNESCO were adopted as working definitions of intended and implemented curricula for our research (see Table 1). The definitions are broad enough and at the same time provide a good orientation for data selection on different stages of the study.

Table 1: Working Definition of Curriculum in CodeVET

Intended Curriculum	"A set of formal documents which specify what the relevant national education authorities and society expect that students will learn at school in terms of knowledge, understanding, skills, values, and attitudes to be acquired and developed, and how the outcomes of the teaching and learning process will be assessed. It is usually embodied in curriculum framework(s) and guides, syllabi, textbooks, teacher's guides, content of tests and examinations, regulations, policies and other official documents …" (IBE-UNESCO, 2013).
Implemented Curriculum	"The actual teaching and learning activities taking place in schools through interaction between learners and teachers as well as among learners, e.g., how the intended curriculum is translated into practice and actually delivered. Also defined as the 'curriculum in action' or the 'taught curriculum'" (IBE-UNESCO, 2013).

3.2 Competence-Based Approach

Competence-based education, is becoming one of the leading paradigms for modernization of contemporary professional, vocational and continuing education, at both system-level and the level of educational processes (Biemans et al., 2004; Hodge et al., 2019; Wesselink et al., 2010). Broad recognition of the competence-based approach in VET is explained by an expectation that it contributes to narrowing the gap between educational and professional spheres, and allows an easier transition from school to work (Biemans et al., 2004). However, a concept of competence, which underlines the competence-based approach in education, is still very diffuse (Baumeler, 2019; Hodge et al., 2019). There is no universally accepted definition of competence, which can cover a large variety of the ways in which the term is used (Weinert, 2001; Winterton, 2012). Weinert (2001) conducted a study exploring different theoretical approaches to the concept of competence for the Organization for Economic Co-operation and Development (OECD)'s international and interdisciplinary project DeSeCo (Definition

and Selection of Competencies: Theoretical and Conceptual Foundations). He distinguished nine different ways in which a concept of competence is defined or interpreted theoretically: General cognitive ability, specialized cognitive skills, competence-performance model, modified competence-performance model, motivated action tendencies, objective and subjective self-concepts, action competence, key competencies, and meta-competencies (Weinert, 2001). Boahin et al. (2014) further point out, that different organizations and countries use the same term of competence but conceptualize it differently based on their institutional structures and labor processes. Le Deist and Winterton (2005) argue that national contexts influence understanding of competence; however, Winterton (2012) underlines that even within countries, there are diversities in the understanding and use of competence approaches across sectors or between different education spheres. Consequently, its essential features and modalities within national VET systems and internationally are heterogeneous (Baumeler, 2019). Due to the heterogeneity of the competence concept, no single competence concept was chosen as a basis for the research from the start. Instead, the understanding and conceptualization of the competence-based approach in the English-speaking world, as well as Russian and Chinese theoretical discourses, will be explored and elaborated (see Section 4.1).

4 Collaborative Development of the Analysis Framework for the First Research Phase

The development process of the analysis framework for content analysis of intended curriculum represents a complex multistage process, with both deductive and inductive steps, which is presented below in Figure 2. The development process of the analysis framework was carried out collaboratively by the whole research team.

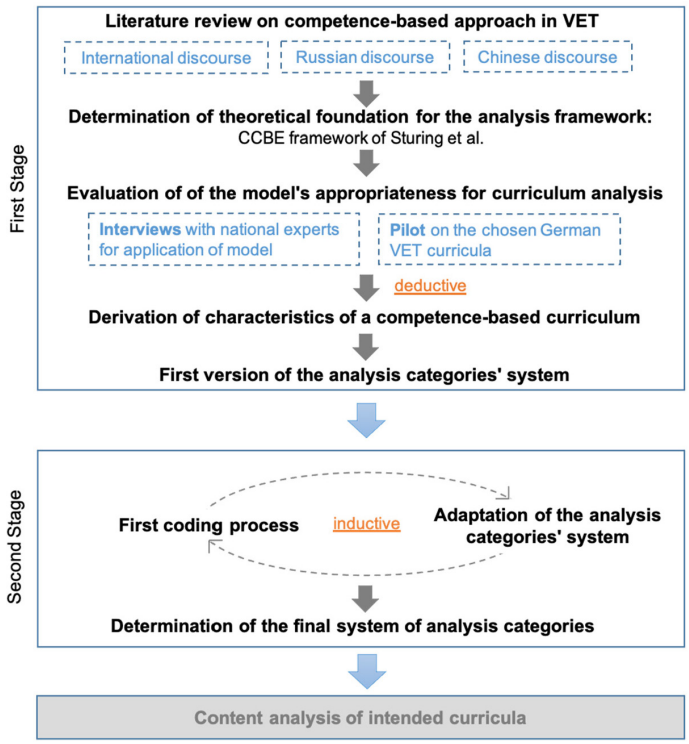


Figure 2: The Development Procedure of the Analysis Framework

4.1 Building the Analysis Framework

In the first stage, the whole team, with researchers from Germany, China, and Russia, worked cooperatively to construct the joint analysis framework. The process started with a literature analysis of the international (published in English language), Russian and Chinese discourses on competence-based (vocational) education. The literature analysis included an evidence review, also called systematic review (Gessler & Siemer, 2020), and a research on various models of competence-based education.

The goal of the evidence review was to identify the main features of the competence-based approach at different curriculum levels in VET from recent scientific discourses on competence-based education. The results of the literature review of international discourse were to build the foundation for the analysis framework development for intended curricula. Furthermore, the results from the analysis of Russian and Chinese discourses aimed to provide the basis for the extension of the analysis framework to target national contexts.

Results gained from the international discourse analysis were evaluated, and several problems regarding their usability for framework development were identified. First, the ar-

ticles in the sample of international discourse, were mainly from English-speaking countries. Furthermore, in the accumulated results, conceptualizations of a competence-based approach from several countries, in particular from Australia, Netherlands and the USA, were predominant, due to the number of articles in the sample dedicated to them. Therefore, the derived features reflect the international discourse on competence-based education only to a limited extent.

Thus, various models in the international discourse, containing characteristics of competence-based VET, were researched as an alternative foundation for building a curriculum analysis framework. The following models were identified: Watson (1991), Deißinger and Hellwig (2005), Wesselink et al. (2007), Wesselink et al. (2010), Sturing et al. (2011). Owing to space constraints, all models cannot be presented here. Although a relative similarity characterizes these models in respect of their constituent features, the model of Sturing et al. (2011) was assessed by our research team as potentially the most suitable foundation for constructing an analysis framework. Here we should clarify our choice:

The Revised Model of Comprehensive Competence-Based Vocational Education (Revised CCBE Model) of Sturing et al. (2011) represents the result of years of research on competence-based vocational education by a Dutch research community. It was revised several times based on the results of constituent studies, which use various empirical data and methods, and therefore it is characterized by a high validity and credibility. Among the considered models, the Revised CCBE Model is the most comprehensive and validated model for evaluation of the "competentiveness" (Sturing et al., 2011, p. 193) of educational programs with a solid theoretical background.

Furthermore, the Revised CCBE Model was recently applied in other national contexts, for instance in Indonesia (Misbah et al., 2019) and in Ethiopia (Solomon, 2016). The successful utilization of the Revised CCBE Model outside of the Dutch VET context is further argument supporting the choice of the Revised CCBE Model in our research.

Another argument concerns the concept of competence underlying the model, which is oriented on the holistic understanding of competence and social constructivist view of learning (Sturing et al., 2011). Although in both countries researched in this project, Russia and China, there is no unified definition of competence in scientific discourse or educational policy documents, a holistic understanding of competence dominates. In Russian scientific literature on VET, competence is often defined as an integrative whole of knowledge, skills and personal qualities, ensuring professional activity (Goljaeva, 2011; Trofimova, 2013; Zeer & Symanjuk, 2005). Some others underline experience as another important element of competence (Zeer & Symanjuk, 2005). Such an understanding of competence is also used in some normative documents in VET. For instance, recently developed methodological recommendations for actualization of educational standards for VET competence are defined as "ability to apply knowledge, skills and practical experience for successful activity in a certain area"

(The Ministry of Education and Science of the Russian Federation, 2015, p. 2). Under the holistic view in the Chinese context, competence emphasized in the VET field is regarded as the integration of knowledge, skills, and attitudes, embodied in an individual's professional work performance, combined with specific work situations (Chen, 2010; He, 2003; Pang, 2010). In most VET policy documents, competence is usually understood as professional competencies which are referred to as the integration of knowledge, skills, attitudes and physical abilities necessary to perform professional activities (Pang, 2010). Therefore, the concept of competence behind the Revised CCBE Model does not contradict the understanding of competence in the researched countries. Furthermore, the comparison of the features of a competence-based curriculum derived from analysis of national discourses, and the characteristics of competence-based VET of the model, demonstrated a considerable conformity.

Taking all the above-mentioned arguments into account, namely the holistic understanding of competence, the comprehensiveness and credibility of the model, as well as its applicability in different national contexts, this Revised Model of Comprehensive Competence-Based Vocational Education was chosen as the basis for the analysis framework, which however still needs further modification by additional characteristics for Russian and Chinese contexts.

The Revised CCBE Model consists of ten principles of competence-based vocational education (Sturing et al., 2011):

1. The study program is based on core tasks, working processes and competences (the qualification profile).
2. Complex vocational core problems are central.
3. Learning activities take place in different concrete, meaningful vocational situations.
4. Knowledge, skills and attitudes are integrated.
5. Students are regularly assessed.
6. Students are challenged to reflect on their own learning.
7. The study program is structured in such a way that the students increasingly self-steer their learning.
8. The study program is flexible.
9. The guidance is adjusted to the learning needs of the students.
10. In the study program attention is paid to learning, career and citizenship competences.

Initially, these principles represented the analysis categories of the common part of the analysis framework. Its applicability in Chinese and Russian contexts was evaluated through interviews with national experts from both countries in the VET field. Their opinion was, that the analysis framework is applicable, but should be further adapted for country-specific contexts. In addition, a pilot study on selected German VET curricula was carried out to test the applicability of the analysis framework for intended curriculum; results demonstrated

that the analysis framework could be used for the analysis of intended curriculum. However, in spite the model's comprehensiveness, some of the concepts behind the principles, for instance self-steering or self-reflection are not sufficiently operationalized to be used for our research purpose. Therefore, a further literature review was necessary to operationalize the selected concepts. Furthermore, the direct use of principles as analysis categories was problematic during the pilot study. In this sense, principles should rather serve as a starting point for determining characteristics of the competence-based curriculum which should be analyzed. For this purpose, the analysis categories and their descriptions were formulated, based on the theoretical foundation of the model. Additionally, the country-specific characteristics with corresponding categories added to the joint part of the analysis framework. Finally, the analysis framework was evaluated during the discussions with project partners in both countries.

As a result of the steps described, the first version of the analysis framework was completed. A typical suggested cross-language translation process (Guillemin et al., 1993) was not included in our development process, because the analysis instrument is applied directly in English for the Chinese and Russian curricular documents by the researchers who are native speakers of Chinese and Russian as well as proficient in English.

4.2 Adapting the Analysis Framework

In the second stage of the analysis framework development, the developed system of categories was applied to empirical data. After analysis of half of the collected curricular documents, various difficulties in the application of the instrument were identified (see Sections 4.2.1–4.2.4). Therefore, a further adaptation process was required. Compared to other procedures of cross-cultural adaptations of research instruments carried out before instrument application (Gjersing et al., 2010), the majority of adaptation steps in our research were performed during the first application of the developed analysis instrument. The procedure of qualitative content analysis in this study, particularly regarding construction of categories, does not strictly correspond to any procedures presented in the literature on content analysis, but rather represents several ideas and steps combined to best suit the specific methodological requirements of our comparative study (see Figure 3). In this regard, Mayring (2000) emphasized that while conducting a qualitative content analysis, researchers should keep in mind that a research question should take precedence over the proposed steps in the procedure of content analysis. If necessary, the procedure can be adapted to fit the specificity of the research better.

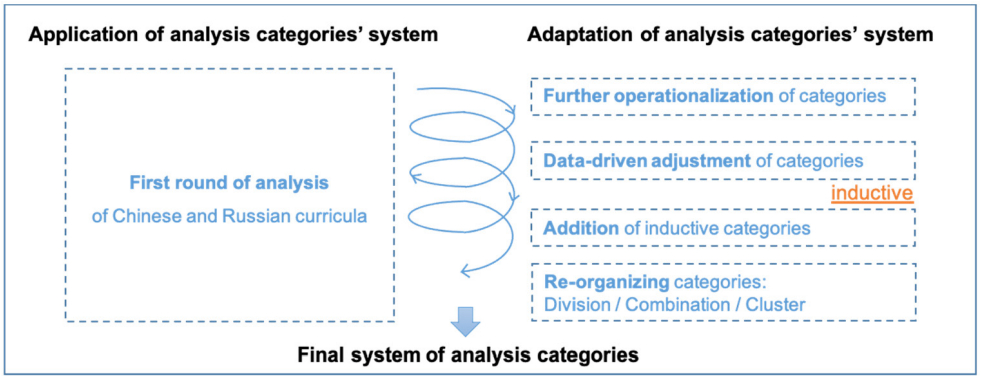


Figure 3: Adaptation Process of the Analysis Framework

Using several examples, different kinds of procedure in the adaptation process of the instrument for the curriculum analysis in our research are presented below.

4.2.1 Operationalization of Categories Using Additional Literature Research

Principles and their descriptions, as explained earlier, built a basis for deriving characteristics of the competence-based curriculum, and categories to analyze them, as well as descriptions of the categories. However, we noticed during the first coding round, that descriptions of some categories, especially the ones concerning teaching and learning, were too general and were difficult to apply to the data. The reason for that lay in the insufficient operationalization of the underlying concepts of the principles. The model was not created for the analysis of curricula, neither did it offer comprehensive instructions regarding realization of didactic principles. Therefore, a literature review of the most relevant scholarly sources on the concepts underlying the principles, was conducted. These concepts are: Self-reflection and self-steering in learning, flexible curricula and learner-centered teaching and learning, curriculum integration, life-long learning, citizenship and career competencies. Due to limited space, we will only provide two examples.

Category of Self-Reflection

The principle of self-reflection in the Revised CCBE model emphasizes that students should be motivated and provided with opportunities to reflect on their learning process and results (Sturing et al., 2011). The reflection practice allows students to understand the connection between specific learning experiences and successful performance in practice (Wesselink et al., 2007). Wesselink et al. (2017) suggest that critical reflection is essential for the development of competences because it facilitates the necessary processes of that deepening and expanding of learning experiences. However, the model does not provide concrete specifications of the didactic implementation of the principle, and implications of the principle for the intended curriculum.

Through further literature research, the most influential and highly cited literature on the concept of reflective learning (Boud et al., 1985; Boyd & Fales, 1983; Dewey, 1938; Kolb, 1976) were overviewed to operationalize the concept of self-reflection, for the purpose of our research. Several didactic implications were derived from these publications and are reflected in the set of indicators for the description of the category *self-reflection* (see Table 2).

Table 2: Common Category of Self-Reflection and its Description

Curriculum Characteristic:
Curriculum prescribes that students have to be stimulated to practice self-reflection on their learning and achievements (explicit manifestation) or/and includes methods and activities involving self-reflection of own learning process and achievements by students (implicit manifestation).
Analysis Category:
Self-reflection
Category Description:
This category includes **a** statements (didactic recommendations, suggestions or prescriptions) in the intended curriculum about the stimulation or encouragement of students to reflect on their learning experience and achievements (explicit); **AND** **b** statements in the intended curricula containing learning and assessment activities, methods and approaches involving self-reflection of students on their learning results and achievements (implicit). **Indicators of Such Methods, Activities or Didactic Recommendations are:** – Students review learning contents and reflect on their previous and current learning experience; – Students are encouraged to actively relate their understanding of tasks to previous knowledge (recollecting); – Teacher encourages students to interact actively with learning materials; – Students reflect on their strength and weakness in relation to learning goals; – Students are encouraged to be open for new information from various sources (internal and external); – Students are encouraged to establish continuity of self with past, present and future; – Debriefing or similar reflection writing technique is used in the learning process; – Students are encouraged to re-examine their experiences; – Teachers encourage students to understanding implication of their personal actions on results/outcomes; – Teachers encourage students to observe the learning situation or problem from a variety of perspectives; – Etcetera.

Category of General Competencies

The principle underlines the importance of the development of the learning, career and citizenship competencies during the study program (Sturing et al., 2011). The general understanding of these competencies, which can be derived from the theoretical background of the model, is that they are not the competencies needed for a specific occupation but required for continuous personal and career development as well as for successful work and social life. However, the authors of the model did not explicitly define or operationalize the competence groups described in the principle. Therefore, for our research purposes, a further operationalization was required.

We started with a literature review of the concepts of learning, citizenship and life-long learning competencies. In the effort to operationalize the learning, career and citizenship

competencies we faced a conceptual problem. Operationalizing these competencies separately based on different resources would lead to the partial loss of the comprehensive objective behind the principle. Furthermore, the theoretical differentiation between two competency groups, learning and career competencies, was not totally clear.

Around the globe on national and supranational levels, there are different concepts of competencies, which can be compared to the understanding of the competence groups presented by the authors of the model. These groups of competencies are, in their meaning, similar to the concept of general, key, generic, transferable, multidisciplinary or cross-curricular competencies, which have been widely discussed in the research and political discourses for some time. We considered and compared the usage of different frameworks: The framework Key Competencies and New Literacy (Dobryakova et al., 2020), the framework of Key Competencies for Lifelong Learning developed at the European Union level (Council of the European Union, 2018), as well as the international and interdisciplinary framework of the key competencies developed within the project DeSeCo (OECD, 2005). Although the frameworks represent conceptually suitable options for our research, and are internationally developed, there were some limitations to their applicability. The European framework is characterized especially by its regional distinctions in respect to its development and application. Although the DeSeCo model was internationally developed, Russia and China were not involved in this process. The framework Key Competencies and New Literacy was recently developed by an international team of researchers and experts from eight countries including Russia and China, who analyzed more than 180 national and international frameworks of competencies, was reviewed (Dobryakova et al., 2020). We considered this framework as a potentially suitable option for our research due to the participation of Russia and China in the development process. However, as with other above-mentioned frameworks, it represents a conceptual instrument, developed theoretically, based on other existing frameworks and still not implemented in the educational contexts of Russia and China.

After consideration of advantages and disadvantages of utilizing the described options, it was decided to concentrate on the essential idea behind the principle, namely on the importance of development of the non-vocational competencies along with occupation-specific competencies. In that way, the main idea of the principle is reflected in our analysis framework. At the same time, a further enlargement of the category system through utilization of a specific conceptual framework could be avoided. The term *general competencies* was pragmatically selected for our research. To operationalize the term *general competencies*, the overarching objective of this competencies group described in the model was brought into focus, instead of using a classification or building various sub-groups of competencies (see Table 3).

Table 3: Common Category of General Competencies and its Description

Curriculum Characteristic:
In the curriculum the attention is paid to the development of various general competencies.
Analysis Category:
General competencies
Category Description:
This category includes statements, referring to the development of competencies which are not directly connected to the chosen profession/vocation, but useful for the professional success and fulfillment in any kind of future professional activity, for the personal fulfillments as well as for life-long learning. This group includes all competencies in the curriculum, which are not directly connected to the chosen vocation.

4.2.2 Data-Driven Adjustment of Categories

During the first coding process, researchers were often confronted with the problem that a category description or name did not fit the data well, and had to be adjusted. The step of further development and adjustment of categories based on data is typical for a qualitative analysis procedure (Kuckartz, 2014). However, while working with material in different languages in our research, every change in the common system of categories needed to be discussed and approved by a team to fit for coding in both contexts, instead of making adjustments independently. For this, questionable coding examples from Russian and Chinese curricular documents were translated into English and discussed, until researchers found a consensual solution on how a category should be modified to fit both data. Additionally, a joint coding guideline containing coding examples from Russian and Chinese curricula in original language, and their translations into English, was created and constantly updated, during the first coding process (see Table 4). Through this approach the subjective reasoning of researchers, which is otherwise not available due to the language aspect, could be made more transparent for the whole team.

Table 4: Example of Coding Guideline

Analysis Category	Categories' Description	Anchor Examples Russia	Coding Rules	Anchor Examples China	Coding Rules
1a. Qualification Profile	**a1.** Statements indicating that qualification profile is used in the curriculum development process	"Forms and methods of assessment of professional competence formation, indicators, and assessment criteria are developed in accordance with the requirements of professional standards." "Формы и методы оценки сформированности профессиональных компетенций, показатели и критерии оценки разработаны в соответствии с требованиями профессиональных стандартов."	Coded: Mentioning of professional standards of any kind	"The accounting training programs are [...] closely combining the requirements of talents training in the accounting professional qualification profile." "会计专业紧密结合了会计职业资格对人才培养的要求."	Coded: Mentioning any kind of use of vocational qualifica-tions or national vocational standards in curriculum

Categories derived from Principle 4 of the model demonstrate an example of such adjustment. The principle emphasizes that knowledge, skills and attitudes, which are elements of competence, should be integrated in the learning and assessment processes (Sturing et al., 2011). Two initially formulated categories were: *Integration of knowledge, skills and attitudes in learning and integration of knowledge, skills and attitudes in the assessment*. Lauterbach (2018b) points out that while developing analysis instruments, as well as the analysis process, and interpretation of results in comparative studies on VET, researchers should take into careful consideration that the same or similar terms and assignments can have different connotations in different national contexts. During the coding process it became clear that elements of competence can vary in different national contexts. In Russian curricula documents, a competence does not include an *attitude* aspect. Instead, in addition to *knowledge* and *skills* it contains an element *practical experience*. Therefore, a slight semantic adjustment of formulations of corresponding categories was made, by replacing the part of the text "knowledge, skills and attitudes" with "elements of competence". Curriculum characteristics and corresponding analysis categories became more universal for analysis without changing the original core idea of the principle.

4.2.3 Reorganizing Categories

Categories and Sub-Categories

During the coding process, the need to reorganize, split or combine some categories was identified. One example represents curriculum characteristics 1a and 1b and their corresponding analysis categories. One of the characteristics derived from the first principle was initially formulated as "The study program is based on core tasks, working processes and competences (the qualification profile)". The first round of coding demonstrated the need to modify the characteristic and analysis category. In curriculum qualification profiles for instance, professional standards in Russian curricula, were often mentioned. In addition, segments indicating use of competencies, working processes or tasks from the labor market in the curriculum design were found. However, in many cases, especially in Chinese curricula, it was unclear from the data, whether the mentioned working processes, competencies or tasks were derived from qualification profiles. To avoid misleading interpretations, it was decided to separate this characteristic into two elements, without loss of the essential meaning of the principle—synchronization of the study program with the labor market through its design: (1) *Qualification profile is used in curriculum development* and (2) *curriculum is based on working processes, tasks and/or competencies*.

Another example of reorganization is the *flexibility* characteristic. It was operationalized based on the results of a literature review in terms of adaptability and accessibility, which demonstrate the degree to which a curriculum can be adjusted to meet students' needs and capabilities (Jonker et al., 2020). Adaptability is connected to flexibility regarding the what and how aspects of learning, while accessibility of curriculum concerns flexibility in the where and when aspects of education. Based on these four elements, sub-categories were built: Content flexibility, flexibility of pedagogies and didactics, location flexibility and time flexibility. During the coding process it became clear that along with elements of flexibility, corresponding to the built categories, curriculum flexibly was often formulated explicitly. In order to include such elements, and avoid further enlargement of the analysis framework, categories were turned into indicators of flexibility, along with the explicit prescription of it. This allowed a more efficient coding process and helped to minimize the complexity of the analysis framework.

Constructing Clusters

The first coding process demonstrated the difficulty in effectively orienting in the system of more than 30 common and country-specific categories. Application of the thematic clusters, which classified curriculum characteristics and corresponding categories into four big groups, allowed a more structured and organized category system. The clusters were adopted from the previous research conducted by Misbah et al. (2019), who used the system of clustering to optimize the presentation of their study results: Cluster 1: Competencies, core tasks,

and linkages to the labor market; Cluster 2: Teaching and learning in competence-based education; Cluster 3: Competence assessment, and Cluster 4: Career, lifelong learning and citizenship competencies. All country-specific categories were integrated in the cluster system.

Comparing and Combing National Categories
Country-specific characteristics, derived from the analysis of national discourses on competence-based curricula, and not coinciding with the models' principles, were added to the analysis framework before the first coding process. They were further adjusted based on the analyzed data, and assigned to clusters. A comparison of categories and coded units demonstrated that some of the Russian and Chinese characteristics and categories could be combined. So, three common additional characteristics were added to the analysis framework and assigned to clusters. For instance, a common characteristic "Labor market experts or actors are involved in the curriculum development, evaluation and implementation (including assessment)" was formulated and integrated into Cluster 1. Accordingly, the analysis category involvement of labor market actors and experts was created with two corresponding sub-categories: (1) *Involvement in curriculum development and evaluation* and (2) *involvement in curriculum implementation*.

4.2.4 Adding Categories Inductively

Finally, several country-specific curriculum characteristics and categories were added to the analysis category system inductively during the first round of analysis. These units were added to analysis frameworks either through a direct indication of the connection of their idea with the competence-based approach, or because they were suited to the clusters' overarching themes. For instance, a curriculum characteristic "Curriculum prescribes that educators responsible for a professional part of the program, should have professional experience in the field they teach" and the corresponding category were added to Cluster 1 as an additional Russian category (see Table 5). The above-mentioned curriculum characteristic was added to Cluster 1 due to the reasoning that teachers who possess professional experience of the labor market in the occupation for which learners are being prepared, are familiar with the real vocational practice and problems, and therefore, can contribute to the approximation of learning processes with their practical insights.

Table 5: Russian Country-Specific Category of Professional Experience of Educators

Curriculum Characteristic:
Curriculum prescribes that educators responsible for professional part of the program should have professional experience in the field they teach.
Analysis Category:
Professional experience of educators
Category Description:
This category includes statements in the curriculum indicating that educators have to possess a professional experience in organizations, the direction of activity of which corresponds to the field of professional activity of future graduates.

A further example of an inductively added category representing a country-specific main-category for analysis of Chinese curricula, was named "Requirements for team of educators". It was developed from curriculum prescriptions concerning specific requirements expected of the team of educators for professional courses, which are aimed to strengthen the connection between the study program and working practice. In similar vein to the reasoning of the Russian example described above, characteristics and corresponding analysis categories of this curriculum were added because they are seen in the curriculum as a means to contribute to the objective of orienting the program toward practice (see Table 6). The elements were afterwards added to Cluster 1. However, we decided not to combine these two inductively developed curriculum characteristics, and corresponding analysis categories in common country-specific units, as in the above-described example of the characteristic (see Table 5), due to a broader meaning of the Chinese curriculum characteristic.

Table 6: Chinese Country-Specific Category of Requirements for Team of Educators

Curriculum Characteristic:
Curriculum prescribes different requirements expected of a team of educators responsible for the professional courses in study program, to strengthen the connection between the study program and real work: – Double qualifications and work experience requirements for school teachers; – Required involvement of experts from company.
Analysis Category:
Requirements for team of educators
Category Description:
This category includes statements, recommendations or requirements about the double qualification of teachers, who are involved in teaching this study program; statements or requirements describing that the teachers for professional courses should have enough working or practical experience in his/her teaching area; statements or requirements that the teacher team should be set up with both experts from enterprise or industry (part-time) and the well-educated teachers with practical experience (full-time).

5 Reflection and Conclusion

As Pilz et al. (2020) showed, a research process conducted by an international team is usually different from the one done by a single researcher or a team from one country. The development of the analysis framework for comparing Russian and Chinese curricular documents within our study is an example of how a comparative instrument for an international multi-language study can be cooperatively developed in an international team. Although some steps are not unique and characteristic to comparative research or the procedure of qualitative content analysis, definite issues were connected to the particularities of conducting an international comparative study with a team of researchers from different countries. In this sense, we would like to reflect on our experience of collaborative development and adaptation of an analysis framework, as well as on methodological challenges we described in this paper.

In the context of this research, the instrument for curriculum analysis was first developed deductively, based on a comprehensive review of English, Russian and Chinese literature and further adapted, based on the empirical material. This process of adaptation of the analysis instrument was a laborious iterative multistep procedure, and was conducted collaboratively. In this approach, the organisation of the research process and language aspects played an essential role. The importance of language proficiency of the researchers conducting international comparative research was emphasised by Bereday (1961) more than half a century ago (Pilz, 2012). The sequence described above, and the combination of steps in the process of framework creation, application and adaptation for national contexts, were only possible because team members are native speakers of Russian or Chinese languages, and at the same time are also proficient in English, which is the common language of the team. So, in our research, the analysis instrument was developed and applied in the English language. Furthermore, a linguistic competence in Russian and Chinese allowed the team direct access to literature and data in the original languages. Thus, it was possible to complement a common analysis framework with country-specific dimensions, based on the analysis of corresponding national scientific discourses, to conduct interviews with national experts for framework validation, as well as to perform a data-driven adaptation of the analysis framework, based on analysis of the original (national) curricular documents. The translation of the analysis framework from Russian and Chinese language before its application was not necessary. Neither was a translation of the curricular document into English, as the common language, necessary, with the exception of coding examples. Potential problems caused by flawed translation could therefore be avoided. However, assuring the concepts' equivalence while applying a developed framework in national contexts was still a challenge. Working with the jointly operationalized concepts instead of translated terms, which can cause different connotations in different national contexts (Lauterbach, 2018b), helped researchers assure each concept's equivalence while applying a developed framework in national contexts.

A data-driven adaptation of the instrument was only possible through continuous intensive communication, since none of the team members could speak both languages of the target countries and therefore could not directly access all the analysed material. To partly overcome this given limitation of the study, the team discussed every required adaptation step in the common part of the analysis instrument and made each decision together. This approach enabled the data-driven adjustments of the common coding frame (see Section 4.2.2) or combining similar national-specific categories in common categories (see Section 4.2.3).

In our experience, the relatively small size of the research team proved to be an important factor, as this helped facilitate the comprehensive iterative adaptation process. The two team members primarily responsible for the second stage of analysis framework development, namely its adaptation during the first round of coding, could work closely during the whole process. Although the researchers belonged to German universities, which were initiators of the research, they had the advantage of being native speakers of the Chinese and Russian languages. Continuous support from research colleagues from target countries during the whole adaptation process, for instance through a discussion of doubtful coding, allowed the team to combine both outsider and insider perspectives to evaluate and reflect on adjustments made (Pilz et al., 2020). Creation of the common coding guidelines, containing examples in original languages and their translated versions from both countries, supported the transparency of the process for all participants, and improved the calibration of coding logic within the team. The effects of researchers' ethnocentric perspective, which are often emphasised in the research community (Lauterbach, 2018a; Mason, 2014; Pilz, 2012), could be reduced.

During the collaborative development of the analysis framework for the research, we also experienced some organisational and methodological limitations of the process. First, such a close cooperative process creates co-dependency between researchers, and requires a certain degree of synchronization of their working. Thus, an iterative adaptation process of the analysis instrument required a concurrent application and testing of changes in the coding frame on data and the following discussion (see Section 4.2.3). Second, the procedure is time-consuming. Probably, a more time-efficient procedure could be achieved through an alternative approach by adapting the created framework separately for every targeted national context. However, that would result in two considerably different analysis frameworks, which would eventually make the follow-up comparison of the results from both countries more complex, and less transparent. Finally, a framework consisting of joint and country-specific analysis categories can become very voluminous and complex. Therefore, its utilization can be very challenging for researchers, since it requires simultaneous consideration of many categories. Alternatively, it is possible to divide the framework into manageable parts and go through the material several times. To avoid such implications, we came to some pragmatic decisions to combine main categories into clusters, and optimize the number of categories by converting selected sub-categories into a description of one main category, which was helpful for the research team.

To conclude, we would like to emphasize that a cooperative and iterative framework development and adaptation process has many advantages, but also some challenges. The analysis framework finally developed, represents an instrument that is, on the one hand, well-adapted to each national context, and on the other hand, allowing a comparison of results along the same dimensions of analysis, in our case, elements of a competence-based approach in curriculum. In our research, such an approach was only possible due to the continuous intensive communication and collaboration of team members who were responsible for different national contexts, and constant reflection of the process.

However, we would like to emphasize that the intention of this paper was not to offer a universal recommendation for developing and adapting the analysis framework for an international study. Instead, based on reflection on our experience, we plead for a flexible approach that allows the research team to use their full potential and maximize the benefits of outsider and insider perspectives, language competencies, and organizational opportunities.

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References

Adamson, B., & Morris, P. (2014). Comparing curricula. In M. Bray, B. Adamson & M. Mason (Eds.), *Comparative education research* (pp. 309–332). Springer International Publishing. https://doi.org/10.1007/978-3-319-05594-7

Baumeler, C. (2019). Competence-based vocational education and training and its cultural context sensitivity. *European Education*, *51*(1), 1–15. https://doi.org/10.1080/10564934.2017.1344503

Bereday, G. Z. F. (1961). Theorie und Methoden der vergleichenden Erziehungswissenschaft. In W. Brezinka (Ed.), *Weltweite Erziehung. Festgabe für Friedrich Schneider zum 80. Geburtstag* (1st ed., pp. 139–162). Herder.

Biemans, H., Nieuwenhuis, L., Poell, R., Mulder, M., & Wesselink, R. (2004). Competence-based VET in the Netherlands: Background and pitfalls. *Journal of Vocational Education & Training*, *56*(4), 523–538. https://doi.org/10.1080/13636820400200268

Billett, S. (2011). *Vocational education: Purposes, traditions and prospects*. Springer Science; Business Media. https://doi.org/10.1007/978-94-007-1954-5

Boahin, P., Eggink, J., & Hofman, A. (2014). Competency-based training in international perspective: Comparing the implementation processes towards the achievement of employability. *Journal of Curriculum Studies*, *46*(6), 839–858. https://doi.org/10.1080/00220272.2013.812680

Boud, D., Keogh, R., & Walker, D. (1985). *Reflection: Turning experience into learning*. Kogan Page. https://doi.org/10.4324/9781315059051

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Boyd, E. M., & Fales, A. W. (1983). Reflective learning. *Journal of Humanistic Psychology*, *23*(2), 99–117. https://doi.org/10.1177/0022167883232011

Chen, P. (2010). Zhi ye neng li guan yan bian de li shi luo ji ji qi li lun shu ping – ji yu neng li ben wei jiao yu yu pei xun fa zhan de yan jiu [The historical relation of the value of professional competence evolution and narrating and reviewing on the value of professional competence-basing on the developing of competency-based education and training]. *Zhong Guo Zhi Ye Ji Shu Jiao Yu* [Chinese Vocational and Technical Education], *6*, 54–57.

Council of the European Union. (2018). Proposal for a council recommendation on key competences for lifelong learning - Adoption. *Official Journal of the European Union*, *61*, 1–13. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:C:2018:189:TOC

Deißinger, T., & Hellwig, S. (2005). *Structures and functions of competence-based education and training (CBET): A comparative perspective*. Internationale Weiterbildung und Entwicklung InWEnt. https://kops.uni-konstanz.de/bitstream/handle/123456789/12147/Structures_and_Functions_of_Competence_based.pdf?sequence=1

Dewey, J. (1938). *Experience and education*. Collier Books; Macmillan.

Dobryakova, M., Seel, N., Moss, G., Barannikov, K., Remorenko, I., & Froumin, I. (2020). Ramka universal'nyh kompetentnostej i novoj gramotnosti [Framework of key competences and new literacy]. In I. Froumin, M. Dobryakova, J. Hautamäki, G. Moss, N. Seel, K. Barannikov, & I. Remorenko (Eds.), *Universal'nye kompetentnosti i novaja gramotnost': Ot lozungov k real'nosti* [Key competences and new literacy: From slogans to reality] (pp. 34–65). National Research University Higher School of Economics.

European Centre for the Development of Vocational Training. (2010). *Learning outcomes approaches in VET curricula: A comparative analysis of nine European countries*. Publications Office of the European Union. https://www.cedefop.europa.eu/files/5506_en.pdf

Evans, K. (2020). Comparative vocational education and training research: What purposes does it serve? In M. Pilz & J. Li (Eds.), *Comparative vocational education research* (pp. 3–19). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-29924-8_1

Fischer, M. (2020). Beyond typologies: Alternative ways of comparing VET systems. In M. Pilz & J. Li (Eds.), *Comparative vocational education research* (pp. 23–41). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-29924-8_2

Frommberger, D. (2000). Länderübergreifende Berufsbildungsforschung ohne Curriculumforschung? Erste Überlegungen zur international-vergleichenden Curriculumforschung am Beispiel der kaufmännischen Berufsbildung. *Zeitschrift für Berufs- und Wirtschaftspädagogik*, *96*(3), 458–469.

Gessler, M., & Siemer, C. (2020). Umbrella review: Methodological review of reviews published in peer-reviewed journals with a substantial focus on vocational education and training research. *International Journal for Research in Vocational Education and Training*, *7*(1), 91–125. https://doi.org/10.13152/IJRVET.7.1.5

Gjersing, L., Caplehorn, J. R. M., & Clausen, T. (2010). Cross-cultural adaptation of research instruments: Language, setting, time and statistical considerations. *BMC Medical Research Methodology*, *10*(1), 13–23. https://doi.org/10.1186/1471-2288-10-13

Goljaeva, N. (2011). Kompetentnostnyj podhod v realizacii ocenki kachestva podgotovki vypusknikov uchrezhdenij srednego professional'nogo obrazovanija [Competence approach in the implementation of quality assessment of training of graduates of secondary vocational education institutions]. *Integracija Obrazovanija* [Education Integration], *4*, 20–24.

Goodlad, J. I., Klein, M. F., & Tye, K. A. (1979). The domains of curriculum and their study. In J. I. Goodlad (Ed.), *Curriculum inquiry: The study of curriculum practice* (pp. 43–76). McGraw-Hill.

Grollmann, P. (2009). Comparative research on technical and vocational education and training (TVET) – Methodological considerations. In F. Rauner & R. Maclean (Eds.), *Handbook of technical and vocational education and training research* (pp. 253–259). Springer.

Guillemin, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal of Clinical Epidemiology*, *46*(12), 1417–1432. https://doi.org/10.1016/0895-4356(93)90142-n

Guo, H., & Pilz, M. (2020). A comparative study of teaching and learning in German and Chinese vocational education and training schools: A classroom observation study. *Research in Comparative and International Education*, *15*(4), 391–413. https://doi.org/10.1177/1745499920959150

He, Z. (2003). Lun neng li yu neng li ben wei zhi ye jiao yu [Discussion on competence and competence-based vocational education]. *Jiao Yu Ke Xue* [Education Science], *4*, 47–48.

Hodge, S., Mavin, T., & Kearns, S. (2019). Hermeneutic dimensions of competency-based education and training. *Vocations and Learning*, *13*, 27–46. https://doi.org/10.1007/s12186-019-09227-y

Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

International Bureau of Education of the United Nations Educational, Scientific and Cultural Organization. (2013). *Glossary of curriculum terminology*. http://www.ibe.unesco.org/en/glossary-curriculum-terminology

Jonker, H., März, V., & Voogt, J. (2020). Curriculum flexibility in a blended curriculum. *Australasian Journal of Educational Technology*, *36*(1), 68–84. https://doi.org/10.14742/ajet.4926

Kolb, D. A. (1976). Management and the learning process. *California Management Review*, *18*(3), 21–31. https://doi.org/10.2307/41164649

Kosmützky, A., Nokkala, T., & Diogo, S. (2020). Between context and comparability: Exploring new solutions for a familiar methodological challenge in qualitative comparative research. *Higher Education Quarterly*, *74*(2), 176–192. https://doi.org/10.1111/hequ.12255

Kuckartz, U. (2014). *Qualitative text analysis: A guide to methods, practice and using software*. SAGE Publications Ltd. https://doi.org/10.4135/9781446288719

Kuckartz, U. (2019). Qualitative text analysis: A systematic approach. In G. Kaiser & N. Presmeg (Eds.), *Compendium for early career researchers in mathematics education* (pp. 181–197). Springer International Publishing. https://doi.org/10.1007/978-3-030-15636-7_8

Lauterbach, U. (2003a). *Vergleichende Berufsbildungsforschung: Theorien, Methodologien und Ertrag am Beispiel der vergleichenden Berufs- und Wirtschaftspädagogik mit Bezug auf die korrespondierende Disziplin comparative education/vergleichende Erziehungswissenschaft* (1st ed.). Nomos-Verl.-Ges.

Lauterbach, U. (2003b). Vergleichende Berufsbildungsforschung und Vergleichende Erziehungswissenschaft als korrespondierende Disziplinen? *Zeitschrift für Berufs- und Wirtschaftspädagogik*, *99*(4), 514–535.

Lauterbach, U. (2018a). Vergleichende Berufsbildungsforschung als Bestätigung für Stereotypen? In P. Grollmann, D. Frommberger & U. Lauterbach (Eds.), *Internationale Weiterbildung, Austausch, Entwicklung: Vol. 9. Internationales Handbuch der Berufsbildung* (pp. 26–29). Bertelsmann.

Lauterbach, U. (2018b). Vergleichende Berufsbildungsforschung und Vergleichsstruktur im IHBB. In P. Grollmann, D. Frommberger & U. Lauterbach (Eds.), *Internationale Weiterbildung, Austausch, Entwicklung: Vol. 9. Internationales Handbuch der Berufsbildung* (pp. 30–33). Bertelsmann.

Lauterbach, U., & Mitter, W. (1998). Theory and methodology of international comparisons. In European Centre for the Development of Vocational Training. (Ed.), *Vocational education and training – The European research field background report – Volume II*. Office for Official Publications of the European Communities. https://www.cedefop.europa.eu/files/RR1_Lauterbach.pdf

Lauterbach, U., & Mitter, W. (2018). Konzeption des internationalen Handbuchs der Berufsbildung. In P. Grollmann, D. Frommberger & U. Lauterbach (Eds.), *Internationale Weiterbildung, Austausch, Entwicklung: Vol. 9. Internationales Handbuch der Berufsbildung* (pp. 18–24). Bertelsmann.

Le Deist, F. D., & Winterton, J. (2005). What is competence? *Human Resource Development International*, *8*(1), 27–46. https://doi.org/10.1080/1367886042000338227

Levander, L. M., & Mikkola, M. (2009). Core curriculum analysis: A tool for educational design. *The Journal of Agricultural Education and Extension*, *15*(3), 275–286. https://doi.org/10.1080/13892240903069785

MacKenzie, J., & Polvere, R.-A. (2009). Tvet glossary: Some key terms. In R. Maclean & D. Wilson (Eds.), *International handbook of education for the changing world of work: Bridging academic and vocational learning* (pp. 59–76). Springer Netherlands. https://doi.org/10.1007/978-1-4020-5281-1_4

Malekipour, A., Hakimzadeh, R., Dehghani, M., & Zali, M. R. (2017). Content analysis of curriculum syllabus for the educational technology discipline based on entrepreneurial competencies. *Interdisciplinary Journal of Virtual Learning in Medical Sciences*, *8*(4). https://doi.org/10.5812/ijvlms.62156

Mason, M. (2014). Comparing cultures. In M. Bray, B. Adamson & M. Mason (Eds.), *Comparative education research* (pp. 165–196). Springer International Publishing. https://doi.org/10.1007/978-3-319-05594-7

Mayring, P. (2000). Qualitative content analysis. *Forum: Qualitative Social Research*, *1*(2). https://doi.org/10.17169/FQS-1.2.1089

McDonald, L. (2012). Educational transfer to developing countries: Policy and skill facilitation. *Procedia – Social and Behavioral Sciences*, *69*, 1817–1826. https://doi.org/10.1016/j.sbspro.2012.12.132

Ministry of Education and Science of the Russian Federation. (2015). *Metodicheskie rekomendasii po aktualizasii deystvuyushix federal'nix gosudarstvennix obrazovatel'nix standartov srednego professional'nogo obrazovaniya suchetom prinimaemix professional'nix standartov* [Methodological recommendations for actualization of the current federal state educational standards for VET in accordance with the adopted professional standards]. The Ministry of Education and Science of the Russian Federation.

Misbah, Z., Gulikers, J., Dharma, S., & Mulder, M. (2019). Evaluating competence-based vocational education in Indonesia. *Journal of Vocational Education & Training*, *6*(5), 1–28. https://doi.org/10.1080/13636820.2019.1635634

Organization for Economic Co-operation and Development. (2005). *Definition and selection of competencies: Executive summary*. DeSeCo. https://www.deseco.ch/bfs/deseco/en/index/02.html

Pang, S. J. (2010). *Zhi ye jiao yu shi yu zhong de zhi ye neng li yan jiu* [Study on competence development of learner in the view of vocational education] [Doctoral dissertation, Tianjin University].

Parreira do Amaral, M. (2015). Methodologie und Methode in der international vergleichenden Erziehungswissenschaft. In M. Parreira do Amaral & S. K. Amos (Eds.), *New frontiers in comparative education: Vol. 2. Internationale und vergleichende Erziehungswissenschaft: Geschichte, Theorie, Methode und Forschungsfelder* (1st ed.). Waxmann.

Phellas, C. N., Bloch, A., & Seale, C. (2011). Structured methods: Interviews, questionnaires and observation. In C. Seale (Ed.), *Researching society and culture* (pp. 181–205). Sage.

Phillips, D. (2009). Aspects of educational transfer. In R. Cowen & A. M. Kazamias (Eds.), *International handbook of comparative education* (pp. 1061–1077). Springer Netherlands. https://doi.org/10.1007/978-1-4020-6403-6_67

Pilz, M. (2012). International comparative research into vocational training: Methods and approaches. In M. Pilz (Ed.), *The future of vocational education and training in a changing world* (pp. 561–588). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-18757-0_30

Pilz, M., Harris, R., Zenner-Höffkes, L., & Zirkle, C. (2020). Undertaking comparative VET research in international teams: The example of exploring recruitment and training cultures in SMEs in Germany, Australia and the United States. In M. Pilz & J. Li (Eds.), *Comparative vocational education research* (pp. 291–309). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-29924-8_17

Pilz, M., Krisanthan, B., Michalik, B., Zenner, L., & Li, J. (2016). Learning for life and/or work: The status quo of pre-vocational education in India, China, Germany and the USA. *Research in Comparative and International Education*, *11*(2), 117–134. https://doi.org/10.1177/1745499916637173

Pilz, M., & Li, J. (2012). What teachers in pre-vocational education should each and what they actually teach: A comparison of curricula and teaching in Germany and China. *Research in Comparative and International Education*, *7*(2), 226–247. https://doi.org/10.2304/rcie.2012.7.2.226

Pilz, M., & Li, J. (2020). *Comparative vocational education research*. Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-29924-8

Raivola, R. (1985). What is comparison? Methodological and philosophical considerations. *Comparative Education Review*, *29*(3), 362–374. https://doi.org/10.1086/446527

Schreier, M. (2014). Varianten qualitativer Inhaltsanalyse: Ein Wegweiser im Dickicht der Begrifflichkeiten. *Forum qualitative Sozialforschung / Forum: Qualitative Social Research*, *15*(1).

Shkedi, A. (2009). From curriculum guide to classroom practice: Teachers' narratives of curriculum application. *Journal of Curriculum Studies*, *41*(6), 833–854. https://doi.org/10.1080/00220270902927030

Solomon, G. H. (2016). *Towards competence-based technical-vocational education and training (TVET) in Ethiopia* [Doctoral dissertation, Wageningen University].

Sturing, L., Biemans, H. J. A., Mulder, M., & De Bruijn, E. (2011). The nature of study programmes in vocational education: Evaluation of the model for comprehensive competence-based vocational education in the Netherlands. *Vocations and Learning*, *4*(3), 191–210. https://doi.org/10.1007/s12186-011-9059-4

Trofimova, N. (2013). Integracija vospitanija i obuchenija v kolledzhe [Integration of education and training in a college]. *Obrazovaniem I Samorazvitie* [Education and Self-development], *2*(36), 76–79.

Van den Akker, J., Fasoglio, D., & Mulder, H. (2010). *A curriculum perspective on plurilingual education*. Council of Europe.

Watson, A. (1991). Competency-based vocational education: Is this the answer? *The Vocational Aspect of Education*, *42*(114), 133–145. https://doi.org/10.1080/10408347308003621

Weinert, F. E. (2001). Concept of competence: A conceptual clarification. In D. S. Rychen & L. H. Salganik (Eds.), *Defining and selecting key competencies* (pp. 45–65). Hogrefe & Huber.

Wesselink, R., Biemans, H., Gulikers, J., & Mulder, M. (2017). Models and principles for designing competence-based curricula, teaching, learning and assessment. In M. Mulder (Ed.), *Competence-based vocational and professional education: Bridging the worlds of work and education* (pp. 533–553). Springer International Publishing. https://doi.org/10.1007/978-3-319-41713-4_25

Wesselink, R., Biemans, H., Mulder, M., & Elsen, E. (2007). Competence-based VET as seen by Dutch researchers. *European Journal of Vocational Training*, *40*, 38–51.

Wesselink, R., Dekker-Groen, A. M., Biemans, H. J. A., & Mulder, M. (2010). Using an instrument to analyse competence-based study programmes: Experiences of teachers in Dutch vocational education and training. *Journal of Curriculum Studies*, *42*(6), 813–829. https://doi.org/10.1080/00220271003759249

Winterton, J. (2012). Varieties of competence: European perspective. In M. Pilz (Ed.), *Research. The future of vocational education and training in a changing world* (1st ed., pp. 455–480). Springer VS.

Wragg, E. C. (1999). *An introduction to classroom observation* (2nd ed.). Routledge.

Zeer, J., & Symanjuk, J. (2005). Kompetentnostnyj podhod k modernizacii professionalnogo obrazovanija [Competence approach to modernization of professional education]. *Vysshee Obrazovanie* [Higher Education], *4*, 23–30.

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Measuring Quality in Indian VET Institutions: Development Steps Towards a Framework Adapted to the National Context

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Abstract

Purpose: The quality of vocational education and training (VET) processes plays an important role in international education policies and research. In India, issues of quality came into focus in recent years due to an increased demand for skilled workers, and continuing challenges in the area of quality of VET. Existing quality assurance mechanisms of VET in India are characterised by a lack of comprehensiveness and uniform standards. This paper addresses the contextualised development of an Indian-specific approach for quality measurement. It centres on following research question: Which quality areas, criteria and related indicators are of relevance for measuring quality comprehensively?

Approach: Design-based research substantiates the research objective, which is to develop a model that is theoretically and technically sound, as well as adapted to the national context. The question of how to create "cultural-fit" was essential for the research process illustrated in this paper. Starting point for the development of the approach was to build a structured review, and following analysis, with reference to existing models and approaches to quality management. The initial search examined national and international academic sources for quality management in business and education, as well as governmental sources for quality management strategies in VET. A significant number of models were selected, based on inclusion criteria, and these models were aggregated to provide a source for a first own conception of an approach.

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Results: Quality dimensions and criteria were collected and identified with reference to distribution across models. In total, seven major quality areas are identified, namely Institutional Sphere and Context; Personnel; Educational Planning, Provision and Assessment; Learning and Teaching; Leadership and School Management; Industry Linkage and Learner Achievements. In addition, 40 quality criteria are determined under these major quality fields, and relevant quantitative and qualitative sub-indicators for measurement are derived.

Conclusion: The actual results will be a basis for the following pilot-based implementation in India. The model can provide meaningful feedback and data-based recommendations for continuous improvement of the Indian VET system and may furthermore provide for a reflected and contextually adapted implementation in other countries

Keywords: Quality, Vocational Education and Training, VET, India, Polytechnic Colleges, Industrial Training Institutes

1 Introduction

While Indian economic growth has been consistently high during the last three decades, the country is currently in a position where both the employers requiring skilled workers on an intermediate level, and those seeking employment, are facing issues (Kumar et al., 2019; Ramasamy & Pilz, 2020). Because vocational education and training (VET) programmes have gained a place of national importance as a means for gaining employment (Kumar, 2016; Mehrotra et al., 2013; Pilz, 2016b), it becomes imperative for VET institutions to nurture trained and skilled manpower, to meet the demands of different sectors of the economy (Goel, 2011; Ramasamy & Pilz, 2019).

The VET system in India operates through the following four major modes, namely:

1. Secondary and higher secondary schools and Polytechnic Colleges,
2. Industrial Training Institutes (ITIs) which may be public or private,
3. Private training institutes under the National Skill Development Corporation, and
4. Apprenticeship training in different schemes under the Apprentices Act.

Among these, ITIs and Polytechnic Colleges (which may be public or private) are of major relevance in the sector (Agrawal, 2012; Malik & Venkatraman, 2017). Both institutions stand for different strands of formal VET in India which can be categorised into vocational education and vocational training, the two sections being managed by different ministries.

At the level of higher technical education, Polytechnic Colleges in India have recently been structurally affiliated to the Ministry of Skill Development and Entrepreneurship (MSDE) in relevant sub schemes (MSDE, 2020). However, until September 2018, Polytechnics in India were administered by the Ministry of Human Resource Development (MHRD[1]) and accreditation processes and curricula are to date still regulated by the All India Council for Technical Education under the MHRD.

Over the past two decades, the Indian government has made several efforts to increase the quantity of formal VET measures. Thus, the number of ITIs in India has grown dramatically across the country, from under 2,000 in 2007 to 14,779 in 2020, of which 11,715 are private (MSDE, 2021). The increase in the number of private ITIs has been much greater than that of public ITIs (MSDE, 2015).

In 1947 there were 43 Polytechnic colleges with an intake capacity of 3,400 students, and by 2018 there are around 3,440 Polytechnics in India with an intake capacity of 1.5 million students (MHRD, 2019). Nevertheless, although Polytechnics have an essential role, they have not been a main focus of research on the VET system in India (Schneider & Pilz, 2019; Venkatram, 2016). By reason of limitations of space and a different focus for this paper, the section on VET in India will not be further elaborated here. For general information about the Indian VET system, refer to overviews of Pilz (2016a), Wessels & Pilz (2018) and British Council (2016).

The ITIs and Polytechnics in India are facing a number of problems in terms of quality (Goel, 2011; Kumar et al., 2019; Mehrotra, 2014a) which will be discussed in the following sections. In order to avoid the risks inherent in the rapid increase of VET institutions over the past decade (see MSDE, 2015; Venkatram, 2016), stringent regulation and a nationally unified quality assurance system is vital. Consequently, in 2017, the MSDE launched the National Quality Assurance Framework (NQAF) aimed at improving the quality of all education and training and skills programmes in India. But, at this stage, no empirical evidence as to the extent of implementation and outcome of NQAF is found. Thus, measuring quality comprehensively is important for the VET system in India, where not much research has been carried out. This research gap, owing mostly to gaps in data and measurement issues, thus needs to be targeted.

The overall objective of the research project discussed here is to address the need for significant data collection and to design a comprehensive approach to quality measurement in ITIs and Polytechnic Colleges in India. Research and development activities focus on the micro (teaching and learning processes) and meso (organisational/institutional) level of VET institutions in contrast to approaches that target the system- and thus national level of educational governance. Hence, an approach is to be developed that provides for bottom-up processes of institutional development and may be used for external and internal evaluation.

1 The name of the Ministry of Human Resource Development (MHRD) was changed to Ministry of Education in August 2020 (MHRD, 2020). However, the authors use the prior term MHRD in this article.

This paper addresses the first steps of the design of the approach for comprehensive quality measurement. It focuses on the development of quality areas, criteria and related indicators, to build a framework that is theoretically and technically sound as well as adapted to the Indian context.

2 Quality of VET in India: Current Status and Challenges

The quality of VET is frequently highlighted in view of globalised economies and the competitiveness of nations (European Centre for the Development of Vocational Training [CEDEFOP], 2009; Watters, 2015), the systems of education and training being regarded as "the most critical" condition (Galvao, 2014, p. 5) for development and growth of countries around the world. Regarding quality assurance in VET, recent and ongoing international developments concern the establishment of national qualification frameworks, the internationalisation of national qualifications (Watters, 2015), as well as the implementation of quality management approaches in education (Galvao, 2014), like ISO 9000 or other Total Quality Management based models. These developments in VET are partly reflected in Indian educational policies, but in reality are implemented to different degrees.

Quality Issues in Indian VET Institutions

In India, ITIs are perceived as having a lower standing from a social point of view (Agrawal & Agrawal, 2017; Ajithkumar & Pilz, 2019). In addition, the quality issues of VET institutions in India are of great concern, and reforms have been introduced to address the challenges of both increasing the employment opportunities by upskilling a large percentage of young people, and to ensure availability of a skilled workforce to meet regional and national labour market demands (Kotamraju, 2014; Majumdar, 2008; Mehrotra, 2014b; Pilz & Gengaiah, 2019; Ramasamy & Pilz, 2019). Nevertheless, many studies (Agrawal & Agrawal, 2017; Neroorkar & Gopinath, 2019; Rao et al., 2014; Schneider & Pilz, 2019; Tara et al., 2016; Zenner et al., 2017) have pointed out that ITI graduates have very low employability due to factors such as poor resources, outdated curricula, the competence of teaching staff and obsolete equipment in the VET institutions.

A study by Mehrotra et al. (2013), surveyed 43 companies in the states of Karnataka, Maharashtra and Tamil Nadu and found that most of the firms pointed out that their employees came without practical skills, but well versed in theory. In addition, the study by Tara et al. (2016) on the quality of state-run ITIs in Karnataka, Orissa, Tamil Nadu and New Delhi, found that the ITIs have not been meeting the required quality standards, and focus only on theory rather than practical components, with little or no relation to practice or modern technology. They also concluded that infrastructure and equipment in ITIs were inadequate (Tara et al., 2016).

The study conducted by Mehrotra et al. (2014) also found that the majority of students who graduate from Polytechnics lack application-oriented knowledge and problem-solving skills, and could, therefore, not meet the demand of industrial skills. Rao et al. (2014) noted a similar view, that employers are not satisfied with ITI graduates as they lack in technical skills, practical skills and soft skills. Studies revealed that a large percentage of ITI graduates in India face major difficulties in entering the labour market or even remain unemployed despite of their training certificate (Ajithkumar & Pilz, 2019; Joshi et al., 2014; Neroorkar & Gopinath, 2019; Prakash & Gupta, 2002).

Another major problem in VET institutions is the availability of qualified instructors (Ajithkumar, 2016). Many instructors had not received any pedagogical training, are not prepared enough for teaching (Jambo & Pilz, 2017; Pilz & Gengaiah, 2019; Zenner et al., 2017) and were employed on a part-time or term contract basis, which again turned out to be an issue impacting teaching and learning.

A study by Tara et al. (2016) found that 50% of the principals interviewed at government ITIs, responded that they had difficulty in finding qualified trainers, and therefore they are forced to employ temporary instructors lacking in adequate skills, which impacted the teaching and learning process. They further argue that "if the teaching is of poor quality, and the competences taught in the ITI programmes are not meeting the needs of the labour market, vocational training will not be recognised by employers as suitable" (Tara et al., 2016, p. 11).

As Joshi et al. (2014) claim, qualified and motivated teachers and instructors are the bottom line of any training system, and the standard of teaching and training personnel is one of the key indicators to measure the quality of training. There is a huge demand for teachers/instructors in the country´s VET system (Mehrotra, 2014b) which is substantiated by official numbers of the MSDE, reporting 95,000 vacant instructor positions in ITIs in 2020. However, despite of several government efforts to qualify higher numbers of instructors, the present capacity for the training of trainers under the Craft Instructor Training Scheme (CITS) is 7,776 per annum only. Furthermore, seats are frequently not completely filled and utilisation numbers did even decrease by 4% to 81% from 2017 to 2019 (MSDE, 2018; MSDE, 2020). Currently, only 15% of the teaching and training personnel in ITIs has a CITS certification. One reason of trainer shortage lies within insufficient capacities for training. However, other factors can be identified in a complex interaction of the low attractiveness of the vocational education and training system and hence respective teacher positions, entry requirements for CITS training (see MSDE, 2020), and working conditions that need improvement, especially in private ITIs (Pilz & Gengaiah, 2019; Tara et al., 2016). The shortage of (qualified) trainers has major implications on the actual quality of training. Addressing input factors such as the quality of instructors, which impacts directly on learning outcomes, and thus employability, is a great challenge. This can be resolved only if the training quality is enhanced by making

provision for development of well-trained teachers and instructors, with pedagogical skills and experience from the world of work (Mehrotra, 2017; Pilz & Gengaiah, 2019).

The above literature review reveals that despite various skill development initiatives by the government at state and federal level, VET institutions in India suffer due to a range of issues. This affects the overall functioning and quality of vocational training institutions in India (Agrawal & Agrawal, 2017; De, 2019); hence, there is a need for regulation and strengthening of the VET system by ensuring quality training (Chakravorty & Bedi, 2019; De, 2019).

3 Development Process of Model Design

Institutional quality management based on comprehensive models to initiate and steer educational and organisational development processes, as well as a general "culture of quality", are not well-established in the context of VET in India (Tara et al., 2016). The transfer of educational systems and practices is subject to context-dependent difficulties and obstacles that cause demand for contextualisation (Broadfoot, 2000; Vogelsang & Pilz, 2020). Cross-national policy borrowing frequently involves processes of adaptation (Phillips & Ochs, 2003), and often policies cannot be transferred entirely (Li, 2017; Pilz, 2017).

The current approach is based on a concept of prospective evaluation (Li & Pilz, 2019) in the form of an extensive pilot-based test to substantiate and enable a successful transfer of the model. Furthermore, it incorporates cultural and practical adaptation processes from an early stage of development, blending theoretical, practical and culture-specific aspects of development. Therefore, a research approach was chosen that provides for openness and flexibility, allows for a continued cycle of development, and the integration of practical experience within the research process.

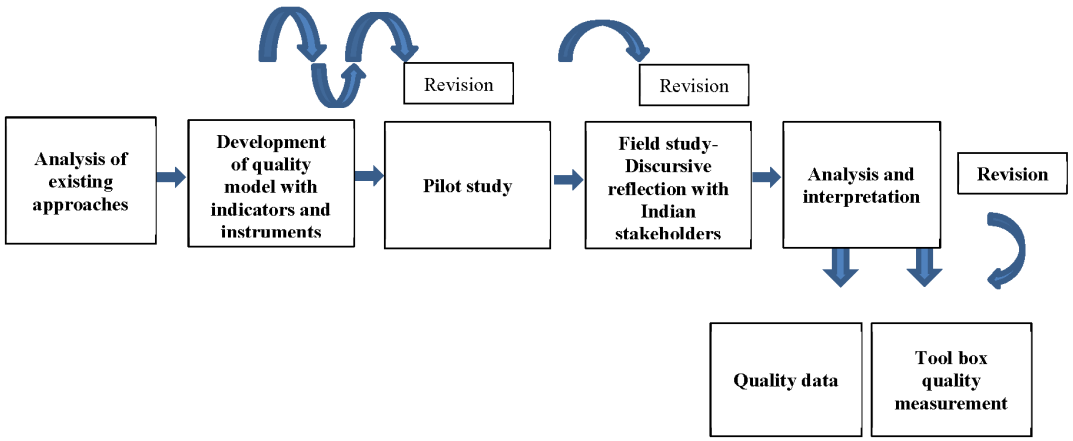


Figure 1: Development Process of Quality Model

The paradigm of Design-Based Research (DBR) builds the foundation for recurrent processes of analysis, design, evaluation and revision of the concept, as it considers the practical approach and relevance (Design-Based Research Collective, 2003; Euler, 2014) of the development objective. The chosen methods were shaped around the overall aim, to develop a model that is technically sound, as well as adapted to the cultural and socioeconomic context. DBR investigates "the manner in which the desirable objective can best be attained in a given context through an intervention yet to be developed" (Euler, 2014, p. 17). Thus, research steps and processes were guided by the need to balance and combine scientific necessities, the integration of practical necessities and realisation of "cultural-fit" (Lewis, 2007). The core research group consisted of Indian as well as German researchers who worked constantly in a bilateral team. Two guest researchers from India were invited to join the project; they spent time with the research group at the University of Cologne, and assisted with field research in India. In addition, four Indian project partners from relevant areas, served for constant intercultural and professional feedback (Pilz et al., 2020). The specific composition of the research team as well as the close cooperation with Indian universities and project consultants enables genuine ownership of the model. Such collaboration in design-based research allows practitioners and researchers to work together to bring about meaningful changes in the context of practice, and helps to refine key components of an intervention (Design-Based Research Collective, 2003).

The first steps of model development involved the elaboration of a theoretical and conceptual base, guided by reciprocal processes of convergence and alignment. These were deliberately structured by oral and written communication and mediation processes.

Taking an organisational perspective to educational institutions, an extensive literature search was conducted, with a focus on national and international quality management approaches in education. Relevant approaches were identified, analysed and summarised. Existing models of school quality, were selected according to deductive and inductive criteria, in order to create a basis for the development of an own approach. Criteria utilised relate to the *acceptability* (Proctor et al., 2011) of the approach in the Indian context, *comprehensiveness* (Alexander, 2008) and overall *elaboration* of the model, as well as the *conceptual base* of models.

Thus, for example, a one-sided concentration of models from German-speaking countries was avoided; instead, internationally recognised, and extensively implemented frameworks, relevant models from Asia, as well as indigenous Indian approaches were included. A total of 44 models were identified and analysed, out of which 14 models were selected for further aggregation. These jointly provide a sound basis for measuring quality, base on a complex and multilevel quality construct, and correspond to the underlying understanding and definitions of educational quality. The approach was supplemented by an extensive literature review, and collection of findings from international school effectiveness and school improvement

research, as well as research into teaching and learning. Indian national education policy and pedagogic research sources, were collected and reviewed in order to specifically include national approaches so as to address significant cultural context and premises (Broadfoot, 2000), and reduce the risk of ethnocentrism (Alexander, 2008, p. 40). By analysis of the selected models, core areas of school quality were identified and consolidated in an iterative process. The adoption of the system and nomenclature of a specific approach was avoided for matters of accessibility, acceptability (Proctor et al., 2011) and connectivity. Institutional core areas of educational quality were merged with respect to broad but consistent fields of organisational actions and processes, to enable a potential subsequent alignment to different quality management approaches. Countries across the world have distinct VET and labour market practices and, based on the industrial growth and socio-economic development of the respective countries, they ascribe a different meaning to the concepts and approaches to the VET system (see CEDEFOP, 2009; Pilz & Li, 2014; Winterton, 2012). Consequently, approaches to quality management, definitions and context, vary according to the culture of the specific country; VET policy, framework, institutional structure and educational system. Thus, a specific consideration of existing Indian models and country-specific needs, guided by intercultural feedback from the Indian research partners, lead to the definition of a main quality area relating to the involvement of the private sector in vocational training and education. In the next step, selected models served for the identification and analysis of quality criteria.

By comparing and aggregating more than 400 indicators and criteria, main criteria and related indicators were identified, evaluated and bundled in a staggered process. A primary selection feature related to the applicability of criteria (Alexander, 2008) with respect to their fit regarding necessities and potentials for measurement at the targeted system level. For the current purpose, criteria had to be selected that target the meso and micro level of the VET system. Aspects were chosen that have the potential to be influenced by individual institutions, in order to provide for a developmental function of the framework. As a next step, further selection features were developed with regard to *acceptability* (Proctor et al., 2011), *social validity* (Nastasi & Hitchcock, 2016), *feasibility* and *appropriateness* (Proctor et al., 2011) of criteria. *Acceptability* was, among others, related to relevance regarding identified problems of the VET system, fit with regard to systemic features and national requirements, as well as compliance with the underlying quality definitions. *Social validity* addressed content-related aspects regarding culture-specific contexts and values, with regard to the target group. *Feasibility* included aspects of measurability, data access and the competencies of stakeholders in the intervention setting. *Appropriateness* was considered separately, as criteria or entire approaches may be accepted but can still prove inappropriate, for example with regard to resources and structures on site or individual needs of consumers or organisations (Proctor et al., 2011). Aspects of the contextual and cultural fit of criteria, related to the complexity of quality aspects (e.g. measuring social competences), linguistic changes with regard to the fundamental understanding

of the content, or negative connotations due to current systemic problems (e.g. the notion of "recognition of prior learning", which is basically perceived as a policy facet), aspects that are culturally considered unsuitable (e.g. promotion of learner self-assessment) or the transfer of Western pedagogical concepts that have no meaning, or a different meaning in the national context (e.g. the German notion of work-process orientation as a pedagogical concept). Here, it needs to be underlined that the omittance of specific terms and concepts like, e.g., the German "vocational concept" which, among others, comprises a highly holistic understanding of the notion of "occupation", does not necessarily lead to a low comprehension and likewise reduced construction of the concept of educational quality. In the past, there have been many attempts by Indian educational authorities to import elsewhere successful policies as part of VET and general education reform efforts (see e.g. Brinkmann, 2015; Mehrotra et al., 2014). However, those attempts, e.g. the expansion of dual apprenticeship structures following the German dual system, could not be implemented as intended until today- or stayed on the level of theoretical policy recommendations (see e.g., Mehrotra et al., 2014). These examples from the Indian context are in line with general findings from educational policy transfer research that show that the export or import of foreign models does not prove successful without appropriate contextualisation (Li, 2017; Steiner-Khamsi, 2012). The approach taken here involves a contextual and cultural adaptation that enables a successful transfer of the model, but does not alter the core component of the approach (Nastasi & Hitchcock, 2016), which is to measure educational quality comprehensively, according to a holistic and empirically substantiated definition of VET quality. Therefore, 40 criteria of school quality were determined, which were underpinned by further qualitative and quantitative sub-indicators. This process of selection and elimination enabled the researchers to identify relevant contextual factors, and enhanced the researcher's understanding of the intervention (Design-Based Research Collective, 2003).

4 Structure and Content of the Model

The basic structure of the model integrates input, process and output, as well as outcome factors of educational quality (see Heneveld & Craig, 1996; Scheerens & Bosker, 1997; United Nations Educational, Scientific and Cultural Organization, 2002) that have been transferred into quality criteria, and supplemented with respective indicators. The underlying approach was extended and systematised by means of an organisational perspective to institutional management and quality. The model encompasses seven areas of institutional quality in vocational education and training. Six areas relate to characteristics of institutional processes and themes, while one additional area addresses results and outcomes with a focus on learner achievements. Areas include: *Institutional Sphere & Context; Personnel; Educational Planning, Provision & Assessment; Learning & Teaching; Leadership & School Management; Industry Linkage and Learner Achievements*.

	1 Institutional Sphere & Context	2 Personnel	3 Educational Planning, Provision & Assessment	4 Learning & Teaching	5 Leadership & School Management	6 Industry Linkage	7 Learner Achievements
Input ↓	**1.1 Facilities & Resources** • General Facilities • Learning Facilities & Resources • Resource Management	**2.1 Personnel Competence & Attitude** • Educational Personnel Qualification **2.2 Working Environment & Job Security** • Working Conditions Teaching Staff • Working Conditions Non-teaching Staff **2.3 Training & Development** • Investment & Engagement in Training • Further Training	**3.1 Educational Provision & Curricula** • Demand-Orientation of Course Programme • Quality School Syllabus **3.2 Assessment Concept & Practices** • Regular Assessment • Holistic Assessment		**5.1 Effective Institutional Organisation** • Supportive & Efficient Institutional Processes		
Process ↓	**1.2 Student Support & Provisions** • Student Support Services • Pre-enrolment & Career Counselling **1.3 Inclusion, Access & Equity** • Availability & Assistance: Schemes for VET Access • Participation of Underrepresented Groups	**2.4 Cooperation & Teamwork** • Cohesion & Cooperative Teamwork		**4.1 Quality Classroom Teaching & Management** • Lesson Preparation • Appropriate Methodology Mix • Transparency & Structure • Active Learning Activities & Time **4.2 Learner Orientation** • Learning Climate • Frequent Individual Feedback • Individual Support & Differentiation **4.3 Holistic Vocational Focus** • Practice & Occupation Orientation • Knowledge Application & Recontextualisation Focus	**5.2 Effective & Cooperative Leadership** • Institutional Strategy & Vision • Cooperative Leadership **5.3 Quality Assurance & Development** • Quality Management Initiatives • Evaluation & Improvement of Educational Quality **5.4 External Relations & Communication** • Public Relations	**6.1 Industry Engagement** • Identification of Industrial Training Needs • Industry Engagement • Functioning IMC Committee (ITI only) **6.2 Placement Coordination & Monitoring** • Functional Placement & In-service Coordination	
Output/ Outcome ↓							**7. 1 Competencies & Qualifications** • Employability • Learner Performance **7.2 Transition & Participation** • Academic Progression • Transition into Work

Figure 2: Structure and Content of Quality Model

The structure of the model involves four levels that allow for the operationalisation of quality with different degrees of abstraction. Within the analysed approaches, areas that comprise primary characteristics of institutional actions and processes were specified with a certain variation in the degree of their comprehensiveness. Here, a two-level approach for the definition of quality areas was chosen, and the distinction between an evaluation area and a quality dimension was introduced. This distinction allows for a further specification of dimensions of institutional quality, which serves to increase accessibility of the model, and enables a focus on selective areas, with reference to specific institutional development processes. A quality dimension is a further, more specific, domain of an evaluation area. Quality dimensions comprise thematically related qualities and activities of evaluation areas, and encompass a range of criteria that have been identified as relevant for educational quality in the specific context. Example quality dimensions within the area of *Learning & Teaching* are: *Quality Classroom Teaching & Management, Learner Orientation and Holistic Vocational Focus*. Quality criteria indicate distinct attributes of institutional and educational quality (Watters, 2015). They may refer to processes, input or output factors, and are specified with reference to institutional and educational objectives. Here, they are conceptualised as complex constructs, generally composed of a range of indicators. An example of a criterion in the dimension *Educational Provision & Curricula would be Demand-Orientation of Course Programme*. Indicators serve for specific measurement purposes. Criteria are operationalised by qualitative indicators and—where appropriate—substantiated by quantitative measures. Example indicators for the criterion *Employability* cover "utilised skills at the workplace (in internships, after final placement)", "employer satisfaction regarding job readiness and actual skill sets", "satisfaction of graduates with trade or occupation acquired" as well as "percentage of graduates entering in designated or related industries" and "percentage of graduates who are in wage employment, self-employed or family business."

Evaluation areas, quality dimensions and related criteria are assumed to have different direct and indirect effects on the quality of individual learning processes. School effectiveness research identified several main influence factors that primarily relate to school context, teachers and instruction (Creemers & Reezigt, 1996; Scheerens & Bosker, 1997; Scheerens et al., 2013), mapped in the current approach. Bell et al. (2004) argue that DBR enables the researchers to capture iterative exploration and refinement of the educational elements in different places where learning occurs. With this context, despite the quality dimensions, criteria and indicators are adapted from school context and educational settings; the developed quality model is contextualised, with the intention to analyse and meet quality issues pertaining to (formal) VET institutions in India and not general education.

As has been discussed in the literature review, the majority of learners who graduate from VET institutions are unemployed, even those who enter into the labour market lack the skills expected to perform at the workplace. VET institutions need to monitor institutional ac-

tions with reference to results and the transition to the (formal and informal) labour market (Tara et al., 2016). Essential for the quality of learning processes and related outcomes, are instructional processes at the classroom level (Creemers & Reezigt, 1996; Hattie & Yates, 2014). Teacher performance is related to competence, personal motivation and institutional context conditions (Rowan, 1996; Yukl, 2002). Within the current framework, the quality of teaching and learning at the classroom level is viewed as the core factor for educational outcomes and, in addition, builds the primary service of institutions from an organisational perspective. Quality dimensions that relate to personnel, institutional context, organisational and leadership aspects as well as stakeholder impact are organised around this service, having a direct or indirect impact on the quality of direct teacher-student interaction (Wahlstrom et al., 2010).

Contextual Adaptations in the Model

Culture and education are complex phenomena (Giorgetti et al., 2017) and education systems are part of the culture of a country. Thus, cultural context is one of the more significant influential factors influencing the functioning of educational institutions, the methods used in the classroom teaching-learning process and teacher-student roles (Akbaş, 2011) and their interactions (Sandoval & Bell, 2004). The cultural context also affects VET practice and behaviour, as well as outcome of programmes, thus, development of such quality models requires an open approach (Rose, 2005). These considerations are important, as the culture has a significant influence on VET, and value and social attitude to VET in India are different from other countries (Pilz, 2016b; Wessels & Pilz, 2018). As Rose (1991) recognised, the formulation of a programme or model is best reflected as a creative act rather than a process of copying; therefore, some adaptation is required on account of local circumstances (Rose, 1991). With this backdrop, the quality model in this study was developed, with some adaptation based on the local circumstances and deep understanding of the socio-cultural dimension. The contextual adaptation of the model is illustrated in the following section.

India is a highly diversified country in terms of language, religion and caste systems, and also has particular influence exerted by the traditional hierarchical social, cultural and economic structure (Chauhan, 2009; Wessels & Pilz, 2018). The inclusive growth strategy of India has aimed at ensuring that individuals across society have equal opportunities in access to education and VET, irrespective of gender, age, caste, ethnicity, religion, socio-economic status and family background, to acquire skills and find employment in the labour market (Goel, 2011; Mehrotra, 2017; World Bank, 2008). Possible students or trainees from the lower ranks of society are often excluded from VET because of their obligation to financially support family members. Furthermore, they often lack general support as well as access to information on VET measures. These considerations are reflected, and some measures are taken, through national policy agendas. The very recent National Policy on Education (MHRD, 2020) document, has also outlined the actions aimed at addressing disparities in ac-

cess to education and vocational training on the basis of gender, or for any underrepresented groups (MHRD, 2020). Therefore, the researchers perceived *"Inclusion, Access & Equity"* as one of the key quality dimensions which is included in the current model, to assess actions of institutions to enable access to VET for the poor, rural population and other disadvantaged groups (World Bank, 2008), by providing necessary information on admission requirements, various scholarship schemes and career counselling services for students.

Often, many of the students and also their parents, particularly from lower social strata, poor families and those from rural regions, are largely unaware of the availability of VET, its relevance, job opportunities, and employability potential. The quality criterion *"Participation of Underrepresented Groups"* under the aforementioned quality dimension, and indicators such as "participation of underprivileged students", "ratio of female students in different vocational courses" and their graduation rates, are included for measurement.

Similarly, the quality criterion component of *"Facilities & Resources"* in the *"Institutional Sphere and Context"* evaluation area, encompasses available general and specialised facilities, as well as equipment in VET institutions. It involves the process related to utilisation and planned maintenance and service of equipment and facilities. Further, maintaining and managing these resources is equally important and ensures facilities should be safe, in an orderly state and hygienic, and correspond to given standards for learning and working processes. In India, the sanitation and hygiene in educational institutions often does not meet required standards, due to lack of resources and/or inadequate institutional support (Rakesh et al., 2014) and therefore, may pose a risk of communicable diseases (United Nations Children's Fund, 1998). Therefore, the researchers considered this criterion as one of the important aspects in the model, to ensure a conducive learning environment; learners and employees are provided with basic amenities such as clean drinking water, toilets, uninterrupted power supply, as some VET institutions in rural regions, face regular power supply issues (Neroorkar & Gopinath, 2020; Ramasamy, 2016). The discussion above shows that this model design research approach aimed to capture the iterative exploration and adaptation of quality elements in the model, based on local customisation and relevance (Bell et al., 2004), in line with issues associated with the socio-cultural context of the country.

The overall system as well as individual VET institutions in India display weak links to local companies and occupation related industries (Pilz & Wiemann, 2020), which results in skill mismatch (Bisht & Pattanaik, 2020; Majumdar, 2008), outdated curricula and missing links to current occupational practice (Neerorkaar & Gopinath, 2019; Ramasamy, 2016). A fundamental goal of the first National Policy on Skill Development in 2009 was to intensify the private sector involvement in formal VET measures. Therefore, the National Skill Development Corporation (NSDC), a public-private partnership, was built under supervision of the MSDE (British Council, 2016). The main task of the NSDC is to initiate and coordinate actions and the involvement of the private sector in VET as well as the development of Sector

Skill Councils. The corporation is involved in curriculum development and the qualification of trainers, and is to function as an information system for the government (MSDE, 2020). However, several initiatives for a higher involvement of the private sector in Indian formal VET, including those related to the NSDC, have not proven successful overall (MSDE, 2016; Pilz, 2016c). The evaluation area *"Industry Linkage"* takes the engagement of industries and trade on the institutional level into specific consideration. In contrast to systemic approaches to public-private involvement, the model emphasises a bottom-up approach of direct interaction and cooperation between VET institutions and local employers. In addition, it addresses the participation of industry and trade members in consulting and steering activities. An important quality dimension of the area relates to *"Placement Coordination & Monitoring"*. The dimension subsumes all activities that relate to final placement after graduation and the coordination of in-service training and internships during education and training. Furthermore, it involves the joint coordination and supervision of apprenticeship training under the Apprentices Act. The involvement of industries and trade does also relate to curricula design and adaptations as well as industry exposure through visits and guest lecturers, and is therefore addressed by specific indicators under the criteria *"Demand-Orientation of Course Programme"* and *"Quality School Syllabus"*, located in the evaluation area *"Educational Planning, Provision & Assessment"*. A further crucial aspect with regard to actual competencies of teaching-personnel is covered by the indicator "years of practical industry- or trade-related experience" under the criterion *"Educational Personnel Qualification"*. Practical working experience of teachers does not only relate to skills and competencies, but in addition contributes to an enhanced openness from the perspective of personnel, regarding the engagement of industry and trade. These examples do also illustrate the interconnectivity of quality areas and dimensions, and exemplify that education and training quality in VET is always a complex interaction of different factors which call for a comprehensive approach for quality measurement.

5 Outlook

The basic aim of the entire study is to develop an approach to measure quality that is tailored to the national context. Following the first research phases described in the sections above, the next step is to evaluate the first version of the quality model in Indian ITIs and Polytechnic Colleges. Institutions for the pretest and following pilot will be located in Delhi and Bangalore. The sample will consist of private as well as governmental institutions at different levels of excellence and configuration, to cover a great variety of VET institutions. As cultural and contextual fit is of major relevance for the study, guaranteed field access, compliance with the qualitative and participative research approach, and the support of the research network

on site, led to the choice for both geographical regions. In addition, the sample was supposed to explicitly cover two different federal states and urban regions in India.

In the pilot-based implementation, the relevance, and appropriateness, of identified quality dimensions, criteria and indicators to the Indian conditions will be validated. A design-based research approach views a successful innovation as a joint product of the designed intervention and the context (Design-Based Research Collective, 2003). Thus, the approach will be evaluated by the research team under close participation of local stakeholders at different levels (district authorities, school management, teachers, and administrative personnel) with regard to content, feasibility and acceptability. Likewise, relevant data on quality will be collected. It is the advantage of a design-based approach, that it does not only focus on how developed models function in specific settings, to document success or failure, but also on processes and interactions that refine the researchers and practitioners understanding of the phenomena in a natural setting (Bell et al., 2004). Therefore, results from the pilot will be analysed and, the model, as well as the criteria and the measurement parameters, will be further adapted and refined.

The optimised model will be implemented in the field, with substantiated insights on context-specific measurement of quality. The revised and finalised approach will be transferred to a quality analysis toolbox, and made available with open access, on an internet homepage in English, to enable easy access and utilisation by Indian vocational training practitioners. The final scientific results of the developed quality model and instruments will also be disseminated through Indian researchers and relevant political actors. Data on quality collected in the main pilot will provide insights for the development and improvement of the VET system. Furthermore, based on the prospective evaluation of the implementation, recommendations for possible systemic changes to enable a successful future implementation of comprehensive quality management approaches in India may be given.

There are significant limitations in this study. The study is planned only in the selected regions of Indian states; therefore, it is encouraged to examine this quality model in other regions considering the diverse culture and distinct economic development within the country. As Li and Pilz (2019) argue, the success of an educational policy transfer or model, is highly dependent on factors such as the extent of contextual adaptation and complex interactions. Limitations also exist with reference to the assessment of long-term implementation outcomes like *impact* and *sustainability* of the current approach The *impact* of an implemented model has been defined by Alexander (2008) as "the intended and/or unintended consequences of the use of the instrument, especially for those—teachers and learners—to whose activities the instruments are applied" (p.15) and can be differentiated with regard to impact in application, and impact in reporting. While detection of certain effects in the pilot-based quality model implementation is to be expected, and revision of the approach with respect to unintended effects will be undertaken, a comprehensive evaluation of impact with reference

to effects on quality data and possible institutional development is not feasible within the current research design. The same holds for *sustainability*, which describes the extent to which an implemented programme is integrated and maintained within an organisation (Proctor et al., 2011). Still, factors that may hinder or contribute to a successful and possibly sustainable implementation can be identified during the pretest and pilot-based implementation and turned into recommendations for future adopters of the model.

Testing the model in two separate institutions is a novel approach and will provide valuable insights. A framework that includes a wide range of input, process, and output factors, including process variables in the area of teaching and learning, has not been implemented in Indian VET yet, which distinguishes the current study from existing non-implemented concepts for quality measurement in India. In such processes, "soft" factors such as key stakeholders in the intervention setting and capacity building activities, are equally important (Li & Pilz, 2019; Ramasamy & Pilz, 2019). These prerequisites provide a substantial base for long-term implementation and initiation of institutional development processes on site.

The joint research project allows researchers to gain insights on key quality issues of VET institutions in India, the reiteration process between both Indian and German research partners, while identifying the quality areas and criteria, has provided an opportunity to understand socio-cultural aspects of both the countries, and experience an exchange of knowledge (Pilz et al., 2020). The success of any programme or model, depends on the specific context of the country, particularly cultural values and assumptions (Rose, 2005). Thus, the developed quality model may be implemented in other countries to analyse the quality of VET institutions, with an adequate degree of contextual adaptation and customisation, based on education and training policy and the VET system of the specific country.

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References

Agrawal, T. (2012). Vocational education and training in India: Challenges, status and labour market outcomes. *Journal of Vocational Education & Training*, *64*(4), 453–474. https://doi.org/10.1080/13636820.2012.727851

Agrawal, T., & Agrawal, A. (2017). Vocational education and training in India: A labour market perspective. *Journal of Vocational Education & Training*, *69*(2), 246–265. https://doi.org/10.1080/13636820.2017.1303785

Ajithkumar, M. U. (2016). Training of teachers: Institutionalising training and development of academic faculty of TVET institutions for realising excellence. In M. Pilz (Ed.), *India: Preparation for the world of work* (pp. 183–210). Springer. https://doi.org/10.1007/978-3-658-08502-5_10

Ajithkumar, M. U., & Pilz, M. (2019). Attractiveness of Industrial Training Institutes (ITI) in India: A study on ITI students and their parents. *Education and Training*, *61*(2), 153–168. https://doi.org/10.1108/ET-04-2018-0102

Akbaş, O. (2011). The Role of cultural context in continuing vocational training: A study on auto repairmen in Turkey. *Australian Journal of Adult Learning*, *51*(1), 69–95. https://files.eric.ed.gov/fulltext/EJ951983.pdf

Alexander, R. J. (2008). *Education for all, the quality imperative and the problem of pedagogy*. Create pathways to access research monograph, 20. Institute of Education University of London. http://www.create-rpc.org/pdf_documents/PTA20.pdf

Bell, P., Hoadley, C. M., & Linn, M. C. (2004). Design-based research in education. In M. C. Linn, E. A. Davis & P. Bell (Eds.), *Internet environments for science education* (pp. 73–88). Lawrence Erlbaum Associates Publishers.

Bisht, N., & Pattanaik, F. (2020). Exploring the magnitude of inclusion of Indian youth in the world of work based on choices of educational attainment. *Journal of Economics and Development*, *23*(2), 128–143. http://doi.org/10.1108/JED-08-2020-0114

Brinkmann, S. (2015). Learner-centred education reforms in India: The missing piece of teachers' beliefs. *Policy Futures in Education*, *13*(3), 342–359. https://doi.org/10.1177%2F1478210315569038

British Council. (2016). *Overview of India´s evolving skill development landscape*. https://www.britishcouncil.org/sites/default/files/18.10.16_overview_of_skill_landscape.pdf

Broadfoot, P. (2000). Comparative education for the 21st century: Retrospect and prospect. *Comparative Education*, *36*(3), 357–371. https://doi.org/10.1080/03050060050129036

Chakravorty, B., & Bedi, A. S. (2019). Skills training and employment outcomes in rural Bihar. *The Indian Journal of Labour Economics*, *62*(2), 173–199. https://doi.org/10.1007/s41027-019-00167-8

Chauhan, C. P. S. (2009). Education for all in India: A second look. *International Journal of Lifelong Education*, *28*(2), 227–240. https://doi.org/10.1080/02601370902757091

Creemers, B. P. M., & Reezigt, G. J. (1996). School level conditions affecting the effectiveness of instruction. *School Effectiveness and School Improvement*, *7*(3), 197–228. https://doi.org/10.1080/0924345960070301

De, D. (2019). Issues and challenges in implementing the skill India movement: Training partner perspective. *Worldwide Hospitality and Tourism Themes*, *11*(1), 54–67. http://doi.org/10.1108/WHATT-10-2018-0065

Design-Based Research Collective. (2003). Design-based research: An emerging paradigm for educational inquiry. *Educational Researcher*, *32*(1), 5–8. https://doi.org/10.3102%2F0013189X032001005

Euler, D. (2014). Design-research – A paradigm under development. In D. Euler & P. F. E. Sloane (Eds.), *Design-based research* (pp. 15–41). Franz Steiner Verlag. https://www.alexandria.unisg.ch/232672/1/DEu-DBR17-37.pdf

European Centre for the Development of Vocational Training. (2009). *Continuity, consolidation and change: Towards a European era of vocational education and training*, Cedefop reference series, 73. Office for Official Publications of the European Communities. http://www.cedefop.europa.eu/files/3055_en.pdf

Galvao, M. E. (2014). Making the case for vocational education and training improvement: Issues and challenges. In European Training Foundation (ETF) (Ed.), *Quality assurance in vocational education and training* (pp. 5–15). ETF. http://pichet-pinit.in.th/wp-content/uploads/2016/08/Quality-assurance-in-VET.pdf#page=5

Giorgetti, F. M., Campbell, C., & Arslan, A. (2017). Culture and education: Looking back to culture through education. *Paedagogica Historica*, *53*(1–2), 1–6. https://doi.org/10.1080/00309230.2017.1288752

Goel, V. P. (2011). *Technical and vocational education and training (TVET) system in India for sustainable development*. UNEVOC. https://unevoc.unesco.org/up/India_Country_Paper.pdf

Hattie, J., & Yates, G. C. R. (2014). *Visible learning and the science of how we learn*. Routledge.

Heneveld, W., & Craig, H. (1996). *Schools Count. World Bank project designs and the quality of primary education in Sub-Saharan Africa*. World Bank Group. http://documents.worldbank.org/curated/en/752881468742862189/Schools-count-World-Bank-projects-designs-and-the-quality-of-primary-education-in-sub-Saharan-Africa

Jambo, S., & Pilz, M. (2017). Perceptions of teachers in industrial training institutes: An exploratory study of the attractiveness of vocational education in India. *International Journal of Training Research*, *16*(1), 4–18. https://doi.org/10.1080/14480220.2017.1403945

Joshi, S., Pandey, G., & Sahoo, B. K. (2014). Comparing public and private vocational training providers. In S. Mehrotra (Ed.), *India's skills challenge: Reforming vocational education and training to harness the demographic dividend* (pp. 86–128). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199452774.003.0003

Kotamraju, P. (2014). The Indian vocational education and training (VET) system: Status, challenges, and options. *Community College Journal of Research and Practice*, *38*(8), 740–747. https://doi.org/10.1080/10668926.2014.897085

Kumar, K. (2016). ITIs/ITCs: Industrial Training Institutes/Industrial Training Centres. In M. Pilz (Ed.), *India: Preparation for the world of work – Education system and school to work transition* (pp. 65–80). Springer. https://doi.org/10.1007/978-3-658-08502-5_5

Kumar, R., Mandava, S., & Gopanapalli, V. S. (2019). Vocational training in India: Determinants of participation and effect on wages. *Empirical Research in Vocational Education and Training*, *11*(3), 1–17. https://doi.org/10.1186/s40461-019-0078-y

Lewis, T. (2007). The problem of cultural fit–What can we learn from borrowing the German dual system? *Compare*, *37*(4), 463–477. https://doi.org/10.1080/03057920701366408

Li, J. (2017). *Policy Transfer von deutschen Evaluationskonzepten der Berufsbildung nach China* [Policy transfer of German evaluation concepts of vocational education and training to China] [Doctoral dissertation]. Springer. https://doi.org/10.1007/978-3-658-18502-2

Li, J., & Pilz, M. (2019). Transferring German evaluation policy to China: A prospective evaluation of peer review in TVET. *Comparative Education Review*, *63*(4), 613–632. https://doi.org/10.1086/705425

Majumdar, S. (2008). *Workforce development in India: Policies and practices*. Asian Development Bank Institute. http://www.esocialsciences.org/Download/repecDownload.aspx?fname=Document130112008230.6895258.pdf&fcategory=Articles&AId=1779&fref=repec

Malik, G., & Venkatraman, A. (2017). The great divide: Skill gap between the employer's expectations and skills possessed by employees. *Industrial and Commercial Training*, *49*(4), 175–182. https://doi.org/10.1108/ICT-11-2016-0071

Mehrotra, S. (2014a). From 5 million to 20 million a year: The challenge of scale, quality and relevance in India's TVET. *Prospects*, *44*(2), 267–277. https://doi.org/10.1007/s11125-014-9305-2

Mehrotra, S. (2014b). Quantity & quality: Policies to meet the twin challenges of employability in Indian Labor Market. *Indian Journal of Industrial Relations*, *49*(3), 367–377. http://www.jstor.org/stable/24546983

Mehrotra, S., Gandhi, A., & Sahoo, B. K. (2013). Estimating India's skill gap on realistic basis for 2022. *Economic and Political Weekly*, *48*(13), 102–111. https://www.researchgate.net/publication/295598089_Estimating_India%27s_skill_gap_on_a_realistic_basis_for_2022

Mehrotra, S., Raman, R., Kumra, N., Kalaiyarasan, & Röß, D. (2014). Vocational education and training reform in India. Business needs in India and lessons to be learned from Germany. Bertelsmann Stiftung. https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/GP_Vocational_Education_and_Training_Reform_in_India.pdf

Mehrotra, V. S. (2017). Vocational education and training in India: Challenges and critical issues. *IASSI-Quarterly: Contributions to Indian Social Science*, *36*(2–3), 290–303. https://web.b.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=85597d97-6bef-42a2-87e1-75c9ada6b6fa%40pdc-v-sessmgr02

Ministry of Human Resource Development. (2019). *All India survey on higher education 2018–19*. https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-new/AISHE%20Final%20Report%202018-19.pdf

Ministry of Human Resource Development. (2020). *National Education Policy 2020*. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

Ministry of Skill Development and Entrepreneurship. (2015). *National Policy for skill Development and Entrepreneurship 2015*. http://www.skilldevelopment.gov.in/reports-documents/policies/national-policy-skill-development-and-entrepreneurship-2015

Ministry of Skill Development and Entrepreneurship. (2016). *Report of the committee for rationalization and optimization of the functioning of the sector skill councils*. https://cse.azimpremjiuniversity.edu.in/wp-content/uploads/2018/02/Sharada_Prasad_Report_Vol1.pdf

Ministry of Skill Development and Entrepreneurship. (2018). *Annual report 2017–2018: Progressing towards an empowered India*. https://www.msde.gov.in/assets/images/annual%20report/Annual%20Report%202017-2018%20(English).pdf

Ministry of Skill Development and Entrepreneurship. (2020). *Annual report. 2019–20*. https://www.msde.gov.in/sites/default/files/2020-12/Annual%20Report%202019-20%20English.pdf

Ministry of Skill Development and Entrepreneurship. (2021). ITI count – India all ITIs. https://www.ncvtmis.gov.in/Pages/ITI/Count.aspx

Nastasi, B. K., & Hitchcock, J. H. (2016). *Mixed methods research and culture-specific interventions*. Sage. https://doi.org/10.4135/9781483399959

Neroorkar, S., & Gopinath, P. (2019). Impact of Industrial Training Institutes (ITIs) on the employability of graduates– A study of government ITIs in Mumbai. *Journal of Vocational Education & Training*, *72*(1), 23–46. https://doi.org/10.1080/13636820.2019.1575895

Neroorkar, S., & Gopinath, P. (2020). An employability framework for vocational education and training graduates in India: Insights from government VET institutes in Mumbai. *TVET@Asia*, *15*, 1–18. http://tvet-online.asia/wp-content/uploads/2021/03/03_Neroorkar-and-Gopinath_2020-07-20_Vorlage-Final-Block-1.pdf

Phillips, D., & Ochs, K. (2003). Processes of policy borrowing in education: Some explanatory and analytical devices. *Comparative Education*, *39*(4), 451–461. https://doi.org/10.1080/0305006032000162020

Pilz, M. (2016a). *India: Preparation for the world of work. Education system and school transition*. Springer VS. https://doi.org/10.1007/978-3-658-08502-5_2

Pilz, M. (2016b). Introduction: Why India's focus on preparation for the world of work is highly relevant. In M. Pilz (Ed.), *India: Preparation for the world of work* (pp. 15–23). Springer VS. https://doi.org/10.1007/978-3-658-08502-5_2

Pilz, M. (2016c). A view from the outside: India´s School to work transition challenge – Strengths and weakness. In M. Pilz (Ed.), I*ndia: Preparation for the world of work. Education system and school to work transition* (pp. 345–357). Springer VS. https://doi.org/10.1007/978-3-658-08502-5_2

Pilz, M. (2017). Policy borrowing in vocational education and training (VET) – VET system typologies and the "6 P Strategy" for transfer analysis. In M. Pilz (Ed.), *Vocational education and training in times of economic crisis* (pp. 473–490). Springer. https://doi.org/10.1007/978-3-319-47856-2_26

Pilz, M., & Gengaiah, U. (2019). Teacher training for VET teachers in India. In S. McGrath, M. Mulder, J. Papier & R. Suart (Eds.), *Handbook of vocational education and training* (1733–1746). Springer. https://doi.org/10.1007/978-3-319-94532-3_38

Pilz, M., & Li, J. (2014). Tracing Teutonic footprints in VET around the world? The skills development strategies of German companies in the USA, China and India. *European Journal of Training and Development*, *38*(8), 745–763. http://doi.org/10.1108/EJTD-10-2013-0110

Pilz, M., & Wiemann, K. (2020). Does dual training make the world go round? Training models in German companies in China, India and Mexico. *Vocations and Learning*, *14*, 95–114 (2021). https://doi.org/10.1007/s12186-020-09255-z

Pilz, M., Harris, R., Zenner-Höffkes, L., & Zirkle, C. (2020). Undertaking comparative VET research in international teams: The example of exploring recruitment and training cultures in SMEs in Australia Germany and the United States. In M. Pilz & J. Li (Eds.), *Comparative vocational education research: Enduring challenges and new ways forward* (pp. 291–309). Springer VS. https://doi.org/10.1007/978-3-658-29924-8_17

Prakash, B. S., & Gupta, K. P. (2002). Employability pattern of ITI graduates: A profile of the vocational education system. *The Indian Journal of Labour Economics*, *45*(4). 1267–1276.

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and policy in mental health*, *38*(2), 65–76. https://doi.org/10.1007/s10488-010-0319-7

Rakesh, P., Usha, S., Subhagan, S., Shaji, M., Sheeja, A. L., & Subair, F. (2014). Water quality and sanitation at schools: A cross sectional study from Kollam District, Kerala, Southern India. *Kerala Medical Journal*, *7*(3), 62–65. https://www.publishmed.com/index.php/KMJ/article/view/329/281

Ramasamy, M. (2016). *Demand-driven approaches in vocational education and training: A case study of rural population in South India* [Doctoral dissertation]. Springer VS. https://doi.org/10.1007/978-3-658-12510-3

Ramasamy, M., & Pilz, M. (2019). Competency-based curriculum development in the informal sector: The case of sewing skills training in rural South India. *International Review of Education*, *65*(6), 905–928. https://doi.org/10.1007/s11159-019-09810-4

Ramasamy, M., & Pilz, M. (2020). Vocational training for rural populations: A demand-driven approach and its implications in India. *International Journal for Research in Vocational Education and Training*, *7*(3), 256–277. https://doi.org/10.13152/IJRVET.7.3.1

Rao, K. S., Sahoo, B. K., & Ghosh, D. (2014). The Indian vocational education and training system: An overview. In S. Mehrotra (Ed.), *India's skills challenge: Reforming vocational education and training to harness the demographic dividend* (pp. 37–85). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199452774.003.0002

Rose, R. (1991). What is lesson-drawing? *Journal of Public Policy*, *11*(1), 3–30. https://doi.org/10.1017/S0143814X00004918

Rose, R. (2005). *Learning from comparative public policy: A practical guide*. Routledge.

Rowan, B. (1996). Standards as incentives for instructional reform. In S. H. Fuhrman & J. A. O'Day (Eds.), *Rewards and reform: Creating educational incentives that work* (pp. 195–225). Jossey-Bass.

Sandoval, A., & Bell, P. (2004). Design-based research methods for studying learning in context: Introduction. *Educational Psychologist*, 39(4), 199–201. https://doi.org/10.1207/s15326985ep3904_1

Scheerens, J., & Bosker, R. (1997). *The foundations of educational effectiveness*. Elsevier Science.

Scheerens, J., Witziers, B., & Steen, R. (2013). A meta-analysis of school-effectiveness studies. *Revista de Educación*, *36*(1), 619–645. https://doi.org/10.4438/1988-592X-RE-2013-361-235

Schneider, S., & Pilz, M. (2019). The function and institutional embeddedness of polytechnics in the Indian education system. *International Journal for Research in Vocational Education and Training*, *6*(3), 284–308. https://doi.org/10.13152/IJRVET.6.3.5

Steiner-Khamsi, G. (2012). Understanding policy borrowing and lending. Building comparative policy studies. In G. Steiner-Khamsi & F. Waldow (Eds.), *Yearbook of education 2012. Policy borrowing and lending in education* (pp. 3–17). Routledge. https://doi.org/10.4324/9780203137628

Tara, N., Kumar, S., & Pilz, M. (2016). Quality of VET in India: The case of Industrial Training Institutes. *TVET@Asia*, *7*, 1–17. http://tvet-online.asia/wp-content/uploads/2020/03/tara_etal_tvet7.pdf

United Nations Educational, Scientific and Cultural Organization. (2002). EFA global monitoring Report. Education for all: Is the world on track? UNESCO Publishing. https://unesdoc.unesco.org/ark:/48223/pf0000129053

United Nations Children's Fund. (1998). *A Manual on school sanitation and hygiene, water, environment and sanitation technical guidelines series* - No. 5. IRC International Water and Sanitation Centre.

Venkatram, R. (2016). (Technical) Colleges: Technical education in India – The strengths and challenges. In M. Pilz (Ed.), *India: Preparation for the World of Work* (pp. 81–102). Springer. https://doi.org/10.1007/978-3-658-08502-5_6

Vogelsang, B., & Pilz, M. (2020). Conditional factors for training activities in Chinese, Indian and Mexican subsidiaries of German companies. *European Journal of Training and Development*. Advance online publication. https://doi.org/10.1108/EJTD-04-2020-0066

Wahlstrom, K. L., Seashore Louis, K., Leithwood, K., & Anderson, S. E. (2010). *Investigating the links to improved student learning. Executive summary of research findings*. The Wallace Foundation. https://www.wallacefoundation.org/knowledge-center/Documents/Investigating-the-Links-to-Improved-Student-Learning-Executive-Summary.pdf

Watters, E. (2015). *Promoting quality assurance in vocational education and training*. The ETF approach. https://www.etf.europa.eu/sites/default/files/m/B77049AC22B5B2E9C125820B006AF647_Promoting%20QA%20in%20VET.pdf

Wessels, A., & Pilz, M. (2018). *India. International handbook of vocational education and training*. P. Grollmann, D. Frommberger, U. Clement, T. Deißinger, U. Lauterbach, M. Pilz, & G. Spöttl (Eds.). Barbara Budrich. https://www.bibb.de/veroeffentlichungen/de/publication/download/9574

Winterton J. (2012). Varieties of competence: European perspectives. In M. Pilz (Ed.), *The future of vocational education and training in a changing world* (pp. 455–480). Springer VS. https://doi.org/10.1007/978-3-531-18757-0_25

World Bank. (2008). *Skill development in India – The vocational education and training system. World Bank*. https://openknowledge.worldbank.org/bitstream/handle/10986/17937/423150India0VET0no02201PUBLIC1.pdf?sequence=1&isAllowed=y

Yukl, G. (2002). *Leadership in organizations* (5th ed.). Prentice Hall.

Zenner, L., Kumar, K., & Pilz, M. (2017). Entrepreneurship education at Indian industrial training institutes: A case study of the prescribed adopted and enacted curriculum in and around Bangalore. *International Journal for Research in Vocational Education and Training*, *4*(1), 69–94. https://doi.org/10.13152/IJRVET.4.1.4

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Cooperation Between Learning Venues and its Limits: The Hotel Industry in Cancún (Mexico)

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Abstract

Purpose: Recently, high-quality vocational education and training has attracted much attention in Mexico. In this context, more practically applied skills are taught "on a dual basis", combining classroom-based training with practical, on the job, training within the company. Dual practices are expected to modernize the skill formation system, and simultaneously support companies, while ensuring provision of skilled workers. For this reason, the Mexican vocational training system has been reformed in recent years. Hence, it is necessary for vocational schools and universities interact closely with companies in order to coordinate their activities. The aim of this paper is to examine the cooperation between learning venues of vocational education in the hotel industry in Cancún (Quintana Roo, Mexico), one of the most important tourism destinations in Latin America. By using this empirical case, the study contributes to research in vocational education and training about the principles that are necessary for successful cooperation between learning venues. This study thereby critically discusses the setting of common goals, communication between companies and training organizations, and governance.

Method: In an exploratory approach and based on a qualitative framework, ten face-to-face expert and semi-structured interviews were conducted in Cancún. The interviews were then fully transcribed and evaluated using qualitative methods. The exploratory and qualitative study is complemented by further document analysis.

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Findings: The results show that for successful cooperation between learning venues, the coordination of a common goal (to secure the availability of skilled workers) between different actors, and communication between companies and educational organizations (vocational school/university), are particularly important for successful cooperation. Furthermore, it seems that companies are taking on a dominant role, so that vocational training organizations must be more in line with the wishes of the hotels. The results indicate that partnership-based action is not very obvious. Accordingly, the aspect of governance plays a subordinate role regarding the cooperation between hotels and educational organizations.

Conclusion: There are general findings, which can also be useful for other regions. This study shows that learning venues cooperation are possible with both vocational schools and universities. In order for learning venues cooperation to be successful, certain principles are needed. However, these principles are related to the specificity of a region or a particular industry.

Keywords: Tourism, Hotel Industry, Cooperation Between Learning Venues, Limits, Mexico, VET, Vocational Education and Training

1 Introduction

Tourism is very important in the economy of many regions in Latin America, and it is growing constantly there (López, 2020a). In 2018, Mexico generated around 22.5 billion U.S. dollars due to international tourists alone (López, 2020b). The relevance of the sector is also evident from the gross domestic product (GDP), 8.5% of GDP is generated by tourism (OECD, 2017).

In recent years, the tourism sector in Mexico has provided employment for more and more people, and at the beginning of 2020 the number of people employed in tourism was approx. 4.5 million. About 9% of all employees in Mexico work in the tourism industry (SEDETUR & INEGI, 2020). Because of its relevance to the country, the promotion of tourism is considered a priority of the Mexican government.

In order to further expand this sector, not only a corresponding tourism infrastructure is needed, but also a well-trained workforce (e.g. Brown et al., 2001; ILO, 2011; OECD, 2018). Especially the tourism sector needs skilled workers at the intermediate level; thus, the importance of vocational training is coming into sharper focus (Baum, 2002; Budría & Telhado-Pereira, 2009).

The efforts being undertaken in this regard in Mexico are a good example. The Mexican government reformed the national vocational training system in the 2010s, and introduced a Mexican model of dual training (Modelo Mexicano de Formación Dual, MMFD), to impart practical work experience. For this purpose, the combination of classroom-based and workplace-based training is important. During this reform process, the involved actors also

developed training concepts for the tourism sector (BIBB, 2015; CAMEXA, n.d). In the literature about different training modes, the design and interaction of the two learning venues is repeatedly presented as particularly successful in combining theory and practice in the learning process (Fürstenau et al., 2014). Very often, the dual apprenticeship system in the German speaking countries is regarded as a role model for a fruitful combination of the different learning venues (Barabasch & Heller, 2020; BMBF, 2013; Lassnigg, 2017; Smith, 2019). However, cooperation between learning venues is only one aspect of the German dual system (e.g. Gonon, 2013; Pilz & Fürstenau, 2019; Raggatt, 1988).

The study presented here takes up the focus of vocational training research, and examines exclusively the cooperation between learning venues, since this is also one important goal for MMFD in Mexico: "Implementation and improvement of dual vocational education and training in schools and Business" (BIBB, n.d.). Since German actors are involved in the implementation and consolidation of MMFD, and the German dual system is considered a model for MMFD (BIBB, n.d; Wiemann & Fuchs, 2018), the German concept of cooperation between learning venues will be presented (see section 2.1). Nevertheless, the concept of vocational education is still further developed and continues to be modified.

The emphasis of the study is on the principles which positively influence the cooperation between the different learning venues. Callan and Ashworth (2004) write for instance: "Open and regular communication is central to successful training partnerships" (p. 52). Important principles are already being discussed not only in various disciplines, but also specifically for the tourism industry (e.g. Augustyn & Knowles, 2000). Therefore, even cooperation between learning venues seems to need certain principles to be successful. Previous international research, however, shows that cooperation between learning venues is often not realized, or is difficult to arrange and maintain (Pilz & Wiemann, 2021). Reasons cited from a company's point of view include inadequate quality (for example of teacher's education or technical equipment in the vocational schools) or inadequate standardization of curricula (Pilz, 2016; Pilz, 2017).

After all, the tourism sector in Mexico has not yet been researched from a training perspective. Therefore, part of this investigation will be to examine the principles which are particularly important for cooperation between learning venues, thereby focusing on the tourism sector in one important region for tourism in Mexico (Cancún).

The focus of this study on Cancún is due to the region's growing importance for the Mexican economy in recent decades (OECD, 2017). Until the 1960s, Cancún was still characterized by a peripheral rural appearance (Carte et al., 2010; Torres & Momsen, 2005a), which changed fundamentally with the initiation of the Mexican government's master plan for tourism development (Torres & Momsen, 2005b). Since then, the city of Cancún has been steadily expanded, with an associated hotel zone located along a lagoon about 20 km long. In the meantime, the number of hotels has risen to around 1,000, and over six million tourists

visit the region every year (SEDETUR, 2019; Statista, 2020). The region around Cancún has developed as one of the most important international tourist destinations of Latin America in just under 40 years (Statista, 2018). This development is also due to state support and promotion (Brenner & Aguilar, 2002; Torres & Momsen, 2005a).

The tourism boom has attracted many workers from other parts of the Yucatán Peninsula, which is strongly influenced by the Maya population, and workers from other areas of Mexico. As a booming tourist destination, Cancún therefore is characterized by many young (interregional) immigrants, who sometimes are regarded as socially uprooted (Reyes Miranda & Cazal Ferreira, 2009). In addition, some studies criticize that the increase in economic growth has only limited effects on the social welfare of the region (Torres & Momsen, 2005b), since only few employers have offered regular employment contracts with better pay in the past, and the vast majority of jobs are on temporary low-wage contracts (Bianet Castellanos, 2010). As a result, the local hotel industry lacks semi-skilled employees, such as receptionists, advanced housekeeping and service personnel, who are used for demanding and complex tasks. Therefore, the provision of vocational training, especially in terms of cooperation between learning venues, could be an opportunity for enterprises to obtain sufficiently trained personnel.

In the following, the state of research concerning the cooperation between learning venues and the principles necessary for successful cooperation is presented. After an explanation of the methodology used, the two actors and their cooperation are discussed with reference to the establishment of dual practices. The following also explains the point of view of the interview partners about the key principle of successful cooperation. Afterwards, the findings will be assigned to the principles and then discussed.

2 Learning Venues and Principles of Successful Cooperation in the Literature

2.1 Cooperation Between Learning Venues

As discussed in the introduction, the combination of classroom-based and workplace-based training has recently started to spread in Mexico, and the German dual system serves as role model for the Mexican actors. In this study, the German dual system will be used and critically discussed as a reference to detect and define cooperation between learning venues. For this reason, it is important for readers who are not familiar with the German dual system, that the concept "cooperation between learning venues" be briefly described.

The terms *learning venues or locations of learning* (in German language called *"Lernort"*) have gained popularity to describe learning at two places (company/school) in Germany (Deissinger, 2010; Gessler, 2017a; Pilz & Fürstenau, 2019). The term *cooperation between learning venues*, introduced by the German Education Council in 1974 (GEC, 1974) to describe duality (company/school), has become established, although in 1964 already the German Committee on Education System defines duality on the basis of the learning places (German Committee on Education System, 1966). But often more than two learning venues are included (e.g. training workshop, virtual classroom) (e.g. Gessler, 2017a; Deissinger, 2010). However, cooperation between learning venues is only one element of duality inside the German dual system (e.g. Pilz & Fürstenau 2019; Raggatt, 1988).

In the literature, especially with a focus on the transfer of a dual approach, the following criteria are discussed, which are important for the transfer of a dual system: The willingness of a company to provide training is crucial. Additionally, the existence of a legal framework, which allows the integration of such practices, on part of the host countries is relevant. Besides, not only scientific-based theoretical knowledge, but also experiential knowledge should be utilized. Cooperation between the state, the economy and the social partners is mentioned as a further criterion (Emmenegger et al., 2019). The focus should be on a holistic occupational profile, and vocational training should serve as a career-relevant measure (Fortwengel & Jackson, 2016; Gonon, 2013; Lewis, 2007; Valiente & Scandurra, 2017). Therefore, many actors are involved in vocational education (Billett & Seddon, 2004) and the singular focus on the learning venues in this study is a strong reduction of the duality in the German dual system in order to gain initial insights.

In other countries, even without a widely implemented German dual system, cooperation between learning venues is also discussed (Markowitsch & Wittig, 2020). For example, the polytechnics in India focus on a stronger link between theory and practice (Schneider & Pilz, 2019). But it is not only system structures that involve a stronger link to practice, companies also want to implement dual practices. Often there are multinational companies, which, due to their specific organizational structure, initiate a form of duality locally, in order to be able to transfer their existing training programs and practices (e.g. Fortwengel & Jackson, 2016; Pilz & Li, 2014). For example, such cooperation is intended to train workers (Mitchell, 1998). Therefore, in the international context, cooperation between companies and vocational schools or universities and colleges, has already gained in importance and attracted scholarly attention (e.g. Graf & Powell, 2017; Pilz, 2017; Valiente & Scandurra, 2017). Based on the international context, this study expands the term of cooperation between learning venues to include academic courses, as well as vocational schools (see also section 3).

2.2 Necessary Principles for Successful Cooperation Between Learning Venues

In this paper, cooperation between learning venues in Germany is critically examined. In particular, the lack of engagement on the part of schools and companies to promote cooperation between learning venues is criticized (Gessler, 2017a). Fürstenau et al. (2014) write: "The coordination on the local level between individual schools and companies is not regulated and often either happens by chance or is instigated for specific reasons, e.g. misbehavior of the apprentice in matters such as daily attendance" (p. 434).

Various principles, important in order for cooperation to be successful, are mentioned in the scientific discourse (e.g. Berliner, 1997; Kanter, 1994). As a result of the scientific discourse, a range of literature exists which "proceeds with steps to take to ensure 'successful' partnerships" (Davies & Hentschke, 2006, p. 211). Kanter (1994) writes as follows: "Successful partnerships manage the relationship, not just the deal" (p. 96). In particular, successful partnerships were also given attention in vocational training research. One example is the study by Billett et al. (2007). Based on a study conducted in Australia, the researchers identified five principles that ensure the establishment and maintenance of cooperation within vocational education and training (Billett et al., 2007). Australia basically has a dual system, but it differs from the German dual system in several aspects such as different applied policies (Harris & Deissinger, 2003). The first principle mentioned by the authors Billett et al. (2007) is: *Building and maintaining shared purposes and goals*. Accordingly, the interests of the actors involved must first be analyzed in order to be able to agree on a common strategy. The set objectives are derived from the identified local challenges. Through the identification, possible solutions are able to be developed. For example, actors enter into a cooperation because they are dissatisfied with the existing quality of the vocational school system. The second important principle is: *Building and maintaining relations with partners*. Within this principle, factors are mentioned that support the establishment and continuation of a relationship. According to this principle, for example, communication between the involved participants, mutual respect or the appreciation of (partial) success, are named. The third principle is: *Building and maintaining capacities for partnership work*. This includes infrastructure as well as resources that are relevant for cooperation. The defined goals can only be achieved if various resources are available. The researchers cite *building and maintaining partnership governance and leadership* as the fourth principle. Governance here means operating in partnership. Therefore, rules are necessary which define the respective roles. This definition should also prevent the pursuit of particular interests. Furthermore, actors must act sensitively, since the respective actions can also cause concern or even mistrust within the cooperation partners. The last principle named is: *Building and maintaining trust and trustworthiness*. The partners should be involved in confidence-building. The exchange of information can also have a positive effect in building trust. In addition, the development of a strategic plan, honesty and respect can help to build trust.

Since the major focus here is on vocational training research, and our study is a pilot study, only three principles identified by Billett et al. (2007) are followed in our study: Building and maintaining shared purposes and goals, building and maintaining relations with partners, building and maintaining partnership governance and leadership. Since dual practices have not existed in Cancún for long, the other two principles are not considered in this study. For example, trust must be built over time (e.g. Dyer & Chu, 2000), which in turn can have an impact on the provision of resources.

Even though the major focus here is on vocational training research, these three principles for successful cooperation are also cited in other disciplines. Economic geography can be mentioned as one example. While often, there only isolated actors in a region or country who try to change the institutional system of skill formation ('institutional entrepreneurs'), as in Vietnam (Wrana & Revilla Diez, 2016), sometimes there is broader cooperation on vocational education and training, as for example in Mexico's manufacturing sector (Wiemann & Fuchs, 2018). Economic geographers emphasize that space usually implies regional disparities, with growing regions as centers, and less prosperous regions that are in peripheral positions; thus, often a focus is on the particular conditions for regional growth and development. Examples are metropolitan areas and clusters. Porter (1998) inspired research on clusters in economic geography, as a possible target to study reduced costs that companies have when they have access to local skilled labor. As a result, enterprises and vocational training organizations can identify the training of skilled workers as a common objective, so that the region also benefits. The relationship between the partners also plays a role. For example, Bathelt et al. (2002) focus on *local buzz*, the diverse exchange of knowledge between actors on a local level, as fundamental for cooperation, where for example, rumors are exchanged. Reputation is a relevant resource for networking, and at the same time results from mutual interaction (Glückler, 2007; Glückler, 2014).

In addition to continuous ongoing cooperation, temporary personal face-to-face contacts are important (Ponds et al., 2009). All this contributes to successfully overcoming existing frictions (Bathelt et al., 2018). Accordingly, the various forms of communication must be taken into account for a successful cooperation. Governance is also discussed and recognized as relevant with reference to cooperation in vocational training (Glückler et al., 2011). Glückler et al. (2011) place the actors (e.g. companies and vocational schools) with their different roles and tasks, in the center of attention. This relates to broader fields of international research on how organizations can overcome institutional differences in space (Cantwell et al., 2010; Krzywdzinski & Jo, 2020).

It is evident from these references that across disciplines, the definition of common goals, the formation of relationships and governance are considered important principles for successful cooperation. Although "guidelines for building better partnerships" (Callan &

Ashworth, 2004, p. 59) were provided in the scientific discourse of vocational education and training, the need for further research is mentioned (Callan & Ashworth, 2004).

Consequently, the three principles of the study by Billett et al. (2007) serve as a starting point for our study of successful cooperation between learning venues in Cancún. The relevant research question in this paper is therefore: *Are a common goal, communication between actors and joint action, equally important in cooperation between learning venues in Cancún?*

3 Methodology

The research question was investigated by an interdisciplinary research team consisting of two senior and two junior researchers from the department of vocational education and of economic geography. For this study, a qualitative approach was chosen to gain explorative insights in order to approach the research subject. Besides, the qualitative approach is useful in order to distil and complete the important influencing variables in relation to answering the research objective. This contributes to results, in which relevant factors are not overlooked (Hollstein, 2011). Therefore, the study comprised qualitative interviews in Cancún in August 2019. The interviewees were selected on the basis of an intensive internet search, which took place in advance.

The interviews were conducted and interpreted as described in the following. Ten face-to-face and semi-structured interviews were conducted as bilateral or group interviews, with a total of 14 experts, such as five Human Resource managers from different hotels (two Mexican and three international hotels), three experts on the administrative level of two business-related authorities (municipal tourist office, tourism ministry), five persons of two educational organizations (headmasters and dual training coordinators of a university and a vocational school) and an expert of an employers' association, in order to gain a broad comprehensive picture of the players in the network of vocational training work in the hotel sector. The experts were selected for the semi-structured interviews because they have insider expertise and knowledge due to their work position (Bogner et al., 2009). A university is also involved in order to pursue this research question, because in Mexico not only companies, but especially universities seem to be very interested in the introduction of a dual system approach (Graf et al., 2014). Accordingly, various forms of combinations of locations of learning, including work-based learning activities (Evans et al., 2006) are considered here.

The questions for the semi-structured interviews were developed on the basis of theoretical literature of both disciplines, vocational education and economic geography, which is quoted in the second section. The focus of the questions was mainly on the macro- ("institutional structures and economic, social and political framework") and meso-level ("organisational and regulatory design of TVET") (Pilz & Wiemann, 2021, p. 98). For example, the connection to the vocational school system or the training strategy of companies were in the

foreground (Pilz & Wiemann, 2021). The micro level was also considered in the interviews such as questions regarding training of learners in the hotels or the educational organizations, but the focus of this paper is on the other two levels. For this reason, questions were asked, for example, with whom cooperation are entered into and what the structure of the respective cooperation is. The interviews also included questions regarding the financing of vocational education. The interviews took place in Spanish and were subsequently fully transcribed. A total of about twelve hours could be evaluated; guided visits to the hotels or the educational organizations are not included in these hours. The evaluation of the interviews was carried out using qualitative content method in order to do justice to the specificity of the subject matter, the conceptual approach and the openness of the questions (Kuckartz, 2014). The transcripts allowed for case summaries that were closely aligned with the statements and did not show any evaluations. With the help of these summaries, categories and tables could be formed to achieve an analysis (Kuckartz, 2014).

Multi-star hotels in the Cancún hotel zone along the lagoon were included for the semi-structured interviews. These hotels are primarily aimed at international guests, the majority of whom come from the USA (SEDETUR, 2019). The hotels in the city of Cancún (on the mainland beyond the lagoon), which are aimed primarily at business or individual travelers, were not included. The focus was on the 4- and 5-star hotels in the hotel zone, because these make up the majority of rooms available in the state in these two categories and therefore form the main agglomeration area (SEDETUR, 2018). The hotel companies located in the region are largely owned by US, Spanish, German and Mexican hotel chains. For this reason, the selection of the hotels was also based on the listed company headquarters. This procedure allows an overview of the cooperation between learning venues. The contact persons in the companies were Human Resource managers or the training officers. Since many actors are active in vocational education in Mexico (e.g. Wiemann & Fuchs, 2018), business-related organizations, which promote vocational education (SEDETUR, n.d.; SEMS, n.d.), were also included in our study. In these organizations visited, interviews were conducted with people at the administrative level.

In order to better place the interview statements in the local context, an intensive web analysis was carried out, comprising an analysis of newspapers such as El Universal (a very popular Mexican newspaper) or databases from INEGI (National Institute of Statistics and Geography). Accordingly, various documents were reviewed for their content regarding vocational education and tourism in order to supplement and secure the knowledge. Both the interviews and the different documents complete the picture of vocational education in the tourism sector in Mexico, since this study uses different data sources (triangulation) (Bowen, 2009).

4 Presentation of the Findings for Cooperation Between Learning Venues in Cancún

In order to answer our research question, the cooperation between learning venues in the hotel industry in Cancún is presented first. Since it is an exploratory study, the findings of the study will be presented before they are discussed in the following part (section 5) and there assigned to the three principles.

First, the decision regarding learning venues cooperation lies with the local hotels; they are not influenced by the headquarters. The learning venues cooperation exist between the hotels and the vocational school as well as between the hotels and the universities in order to provide dual approaches. Only if contracts persist between the hotels and the vocational training organizations, learners can gain practical learning in the hotels. On the one hand, the vocational school offers a Mexican dual system (MMFD). MMFD means that apprentices learn both in vocational schools and in companies (BIBB, 2015). Over half of the learning content are vocational subjects (Kis et al., 2009). In particular, companies and vocational schools play a significant role in training of learners. In the companies at least one person is responsible for the coordination of the learners and employees (called tutors), who should show the work to be done to the learners. Also, the vocational schools have on the one hand teachers who teach the contents and on the other hand a person who is in close contact with the companies (e.g. SEMS, n.d.). In Cancún, the vocational school, which can be assigned to the secondary school level, offers two training courses in the tourism sector, each lasting three years. During the first two years, apprentices are taught entirely at the vocational school, in the final year they spend four days a week in companies and one day at vocational school. The dual training is carried out for the apprentices in areas with rather low formal qualification requirements, such as assistant cook. At the end of the MMFD, the learners also receive their high school diploma in Cancún, through which they can enter university.

On the other hand, there are learning venues cooperation between the hotels and the universities. The local universities offer tourism related courses of study such as tourism management, which send interns for practical phases. The internships for students who also have English language skills, for example, take place at stations such as the reception, and other areas with direct customer contact. This allows a distinction to be made between vocational schools, providing apprentices for entry level occupations and universities providing interns for middle-level positions.

4.1 Building and Maintaining Shared Purposes and Goals

The interviewees mention principles that are important for cooperation between learning venues and which will be described in detail in the following. Firstly, it should be noted that

the two actors (hotels and educational organizations (vocational school, university) have different interests and motives in relation to the vocational training, which is why it is important to set common goals. As already mentioned, there is a significant increase in the number of hotels in Cancún. Therefore, hotels are looking for skilled workers, which educational organizations are trying to prepare for their future professional life. Due to the shortage of skilled workers, both of the actors (hotels and educational organizations) not only have a common challenge but also a common objective, which is why they establish contact with each other. For example, hotel interviewees point out that practical training units prepare learners better for the future. According to one business-related authority the entire region becomes more competitive due to training measures. However, in spite of a common goal, own interests can also be pursued. The vocational training organizations have got their own motives such as the preference for larger local hotels:

> *"We are looking for large hotels that are recognized nationally and internationally. We want them because of their experience in the hotel business. So, we look for these hotels so that the learners have the opportunity to belong to a large, recognized hotel and that is what we look for too." (Educational Organization 1)*

In addition to the educational organizations, the hotels also have their own motives. Some human resources managers emphasize their own, and the hotel's commitment to the training during the practical phases. Other interviewees express interest in the fact that the apprentices and interns represent a reserve pool for later recruitment needs. Still others openly admit that the apprentices and interns are cheap labor for the company. Almost none of the hotels pay a salary to the apprentices and students, apart from food, uniforms, and transport expenses. In contrast, students are obliged to pay their study fees.

Despite the different individual interests of the actors such as the hotels and the educational organizations, the vocational training for the students can only be implemented when the actors cooperate and pursue the common goal, as it is done in this example, by concluding contracts. The pursuit of a common idea is regarded as an essential principle, and the ideas of the two actors must therefore be in harmony.

4.2 Building and Maintaining Relations With Partners

Several interview partners point out the significance of communication between the cooperation partners. Face-to-face or other channels of communication can promote exchange between the hotels and educational organizations. The actors for example connect through messaging services such as Skype, telephone and regular meetings. Communication can be used as a tool in order to achieve a common goal and to sort out the contracts between the

hotels and the educational organizations. Also, through communication positive results can be achieved for all concerned:

> *"That there is always communication, that we can always have a meeting […]. As long as there is that part of communication, we can get better results from each member." (Hotel 1)*

Through communication the actors can also agree on common objectives and all players can be informed of what is expected of them. For example, several hotels argue that they are reluctant to accept apprentices and interns for the practical phase in their companies for less than three months, because it would not be worthwhile. In their opinion, learners can gain more insight over a longer period of time.

4.3 Building and Maintaining Partnership Governance and Leadership

Not only the possibility of communication must be available, but also the areas of responsibility must be clearly established in order to be able to conclude contracts. Therefore, each cooperation partner should know what role they have in the cooperation. For example, two companies argue that learners in educational organizations need to be prepared for the business environment. In this context they should be taught the seriousness of practical learning, where the focus is once again shifting to communication in order to generate such coordination and avoid contract cancellations. Through the meetings, the vocational education organizations can ask what the hotels expect from the teachers. Only through communication can cooperation be successful, such as the training of a skilled worker. One interviewee describes this as follows:

> *"The communication between [Educational Organization] and hotel, working together to have a better product that, in this case, is the learner. That the learner goes well prepared to the hotel so that the hotels tell us: 'This is the perfect learner. This is what I need for my hotel'. So, I think that communication is the most important thing." (Educational Organization 1)*

At the same time, this quote illustrates the responsibility of vocational training providers to prepare learners accordingly. This highlights the importance of the reports that provide information to the vocational education organizations. In these reports persons responsible for the learners in the hotels note the state of the learners as well as cases of inadequate student behavior. The training organizations receive the reports about once a month. This implies that a good preparation of the learners in the vocational education organizations is of a high priority in Cancún. As a result, the learners are no longer accepted for practical phases in their hotels, if the hotels are not satisfied with the "product":

"Maybe these learners did not behave in the right way and then there is a problem. Because if a learner does not behave in the right way and provoke a situation inside the hotel that is not the right one, then we can cancel the training." (Hotel 2)

The hotels can terminate the contracts quite easily because they can train their employees independently. The hotels allow their employees a high degree of upward mobility through their own training offerings, which means that not every hotel relies on cooperation partners.

Nevertheless, a vocational training organization expresses the need for a division of responsibilities between the cooperation partners of the learning venues. According to this, the aspect of governance seems particularly important for vocational training organizations:

"The other scheme is operational work, collaboration: Neither can we leave all the responsibility to the hotel for the formation of the student, nor should the hotel leave it to us. It is a matter of collaboration and balance." (Educational Organization 2)

Besides, the interviews also show that the contracts between the hotels and the vocational training organizations mainly include the legal aspects, for example, what happens when a learner has an accident at work or that the learners continue to have a pupil or student status. The contracts convey less of the contents. In the hotels, the department heads of the respective stations are responsible for the learners. Therefore, the department heads decide which practical skills are taught to the learners.

5 Discussion of the Findings

In the following, the findings from the previous section will be assigned to the three principles of Billett et al. (2007), which are in focus. The findings are thus structured according to the three selected principles. As the following shows the findings are related to the theoretical framework presented in chapter two.

5.1 Building and Maintaining Shared Purposes and Goals

In order to present the aspect of common objectives precisely, a separation of two different perspectives concerning the actors is crucial. On the one hand the focus can only be on the same group or type of actors (different hotels), and on the other hand between the different types of actors (educational organizations versus hotels). This distinction highlights differences which have an influence on the setting of common objectives.

If the hotels in Cancún alone are considered, it can be concluded that even though the great demand for skilled labor in the tourism industry is obvious, the hotels do not enter into agreements among themselves to train skilled workers jointly. Due to the strong local

competition, the hotels are afraid that their staff will move away. This is also illustrated by the following quotation:

> *"As here is a lot of supply, the workers suddenly say: 'They will pay me 300 pesos more or 200 pesos more over there. […] I'm going because they're going to pay me more there'." (Hotel 2)*

Consequently, the liberal labor market with little regulation, a high rate of labor-turnover, and the risk of poaching (Mohrenweiser et al., 2013; Muehlemann & Wolter, 2011) not only has an influence on the setting of common goals. Due to the high level of competition, hotels do not seem to pursue common goals among themselves. This indicates that the hotels do not cooperate with each other in this respect.

However, if the aspect of common goals between various groups of actors is examined, a different result emerges. The individual hotels and the vocational training organizations both have an interest in skilled workers, so that the common goal is found. This goal in particular may become more important in the future, as more hotel zones are being built around the city, which means that more skilled workers are needed. Only when the potential cooperation partners realize that they will benefit from more intensive cooperation, more specific measures can be identified and implemented. There are a lot of hotels entering into partnerships with vocational training organizations in order to train skilled workers together. Therefore, if the different groups of actors are at the center, the results of Billett et al. (2007) can be confirmed. The different interests can be pursued together because they harmonize with the common goal. Thus, hotels get skilled workers and vocational training organizations have got more learners, who in turn pay tuition fees.

In addition, the community can also be mentioned as another actor that aims to promote regional development. Cooperation between learning venues can enable this goal. Finally, the entire region can benefit from the common goals of different players (Porter, 1998). Thus, the definition of common goals between the actors is crucial. The insight of the involvement of different actors should be understood in the further course of the work in relation to common goals.

5.2 Building and Maintaining Relations With Partners

A difference to the study by Billett et al. (2007) can be seen with regard to the principle of "building and maintaining relations with partners", because it seems that communication in particular, stands out as an important principle. Common goals for the different actors can only be set through communication. Vocational training organizations in particular require the exchange of information with the hotels, as this enables them to prepare learners accordingly. Consequently, vocational training organizations especially are dependent on knowing what the hotels expect from them. Discussions can set out the expectations. Therefore, our results

suggest that Callan and Ashworth's (2004) statement that communication between actors is important is confirmed. Likewise, the necessity of *local buzz* is evident (Bathelt et al., 2002).

In Cancún, vocational training organizations seem to depend more on the contracts with the hotels, because only in this way are practical phases possible. For this reason, perceived challenges must also be communicated so that both actors can act. Billett et al. (2007) cite mutual respect as one key to fostering the relationship. In Cancún, this respect is only perceptible to a certain extent, since, for example, legal contracts can be concluded quickly, but at the same time can be revoked easily. Likewise, the appreciation of partial successes is not mentioned. Therefore, all forms of communication seem to gain in importance.

Tynjälä (2008) writes with regard to relationship between schools and companies: "It is important that school-based and work-based learning enter into a closer relationship" (p. 150). This is possible if there is a stronger link between companies and vocational training organizations. Accordingly, communication may be essential if relationships between partners are to be strengthened (Kanter, 1994). The findings therefore indicate that the relations between cooperation partners are probably not very close. It should be examined whether more commitment from the actors is required (Gessler, 2017a) or how the relationship can be further strengthened.

5.3 Building and Maintaining Partnership Governance and Leadership

With regard to the principle of "building and maintaining partnership governance and leadership", further conclusions become evident if we focus on the case of Cancún. First of all, it becomes obvious that there is no partnership-based action between the hotels and the educational organizations. The hotels are in a dominant position because there are about 1,000 hotels on site, which are in competition with each other. Therefore, there is cost pressure on the part of the hotels in order to remain competitive. Hence, they can also quickly terminate contracts with vocational training organizations, if, for example, the learners do not behave according to expectations. The contracts indemnify the hotel if the students are involved in an accident at work. In addition, the hotels ensure that the learners are not employees and that they maintain their learner status. Thus, the hotels do not have to pay the learners a salary. There is also no clear outline of what the learners should learn where. From these remarks, it is evident that the cooperation between learning venues in Cancún is not a matter of partnership; because hotels can train their own employees completely, and an employee can advance from dishwasher to director, it is obvious that the vocational training organizations are dependent on the hotels whereas hotels are not dependent on the training organizations to the same extent. The responsibility is therefore not shared equally.

Since the dual training system is still quite young, and has only been implemented in recent years, the understanding of the other roles may need to be sharpened. Accordingly,

a common consensus would have to be developed in the future to define the various roles. Furthermore, it is not quite clear how the goal of training skilled workers by the different actors is to be achieved. Possibly this is a further point of view, which must be considered in more detail in the future. However, studies already show that even in Germany equal partnerships with regard to cooperation between learning venues do not exist to any large extent (Fürstenau et al., 2014; Gessler, 2017a); thus, this aspect is not unique to Cancún.

Contrary to an earlier study (Baum, 2002), the different actors in Cancún are not dependent on each other. Rather, our data show that the willingness of companies is particularly important in order to enter into cooperation. If more companies are motivated, for example by vocational training organizations taking greater account of the needs of companies (Billett, 2000), then the aspect of governance can become more relevant. For this reason, vocational training organizations have a primary responsibility towards learners in Cancún.

In summary, it can be concluded that the most important principles for successful cooperation between learning venues are that the different actors have common goals and that there should be good communication between the cooperation partners. It is also apparent that the governance aspect between hotels and educational organizations is not yet strongly developed in Cancún. In addition, however, it also becomes evident that hotels are reluctant to set common goals with other hotels because of the fear of losing employees.

It can be concluded that this study provides some indications not only for Cancún, but for tourism in Mexico, and, for example, for further regions in Latin America. But the transfer of findings can only be done very cautiously, as country and local specifics have to be taken into account, which, however, cannot be discussed here. In general, the findings show and literature underlines that cooperation between learning venues can contribute to improve local skill formation systems (Mitchell, 1998). Recently, companies have successfully started cooperation between learning venues with both universities and vocational schools (e.g. Graf & Powell, 2017; Pilz, 2017; Valiente & Scandurra, 2017). But efforts are always needed to strengthen collaborations (Thelen, 2004). In particular, maintaining relationship as well as maintaining partnership governance are central if collaborations are to be successful in the future. For this reason, actors must rely on a variety of mechanisms to achieve common goals.

6 Conclusion

The results indicate that the cooperation of the different actors, which the paper considered very important at the beginning on the basis of the previous research findings, is also of central importance in the empirical case. In particular, the findings show that certain principles are needed. The definition of common goals by the different players, as well as the communication between the hotels and the vocational training organizations, are both necessary

for successful cooperation between learning venues. Furthermore, it seems that there are no complex governance structures. This is particularly due to the fact that hotels are in a stronger position, and dominate the vocational training organizations. It may be important to point out that the state has little influence because the government sets only basic standards. In particular, the state seems to have little influence on the curricula in detail or the contractual arrangements for learners, so that the hotels have a powerful role. Consequently, the constellation of actors must be considered in order to obtain more information about cooperation in Cancún (Emmenegger et al., 2019).

As a result of our study in Cancún, we assume that cooperation between learning venues is advantageous not only for the entire region, but also for the hotels, vocational schools and universities. Hotels can select their future staff from the pool of learners, and vocational education organizations can offer these training courses. The interviewees state that learners benefit from such cooperation because they gain practical experience. Nevertheless, we do not exclude on the basis of these results, that other successful training arrangements may also exist (e.g. Gessler, 2017b; Peters, 2019).

Specifics in other regions and industries may influence the actions of actors, so different principles may be needed for successful collaborations. Accordingly, external factors must be considered. External factors are country-specific contextual influences which can have an impact on the training measures of companies. For example, external factors such as the l*ocal labor market or connectivity to the vocational school system* must also be considered (Vogelsang & Pilz, 2021) in order to determine the required principles. As a consequence, it is important to identify the necessary principles before attempting to bring about a cooperation in order to make it successful. Amery (2000) describes this as follows: "Organizations might wish to consider ways to foster partnership working, such as joint training initiatives with partner organizations or professional groups […]. It will be important to identify those factors that enable sustained commitment to working together" (p. 30). It is therefore evident that each partnership needs different principles in order to be sustained, but which must be agreed upon. By identifying the necessary principles, partnerships can exist in the long term, because the actors are satisfied with the cooperation (Anderson & Narus, 1990). Thus, the cancellation of cooperations can be prevented.

However, there are limitations in our study, as only ten expert interviews were conducted, in one city. It should be pointed out that Cancún is a special tourist region, so the statements should be considered with caution. Therefore, further research is needed to investigate whether similar results would be achieved in other regions. Similarly, a long-term study can identify whether, for example, other necessary principles are relevant. Further research is also necessary with a view to a broader network. This raises the question of whether governance in a larger network should be given greater importance.

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References

Amery, J. (2000). Interprofessional working in health action zones: How can this be fostered and sustained? *Journal of Interprofessional Care*, *14*(1), 27–30. https://doi.org/10.1080/jic.14.1.27.30

Anderson, J. C., & Narus, J. A. (1990). A model of distributor firm and manufacturer firm working partnerships. *Journal of Marketing*, *54*(1), 42–5. https://doi.org/10.2307/1252172

Augustyn, M. M., & Knowles, T. (2000). Performance of tourism partnerships: A focus on York. *Tourism Management*, *21*(4), 341–351. https://doi.org/10.1016/S0261-5177(99)00068-0

Barabasch, A., & Heller, N. (2020). The Swiss PET system and similar programs in Germany and Austria. In M. Pilz & J. Li (Eds.), *Comparative vocational education research enduring challenges and new ways forward* (pp. 97–112). Springer VS. https://doi.org/10.1007/978-3-658-29924-8_6

Bathelt, H., Malmberg, A., & Maskell, P. (2002). Clusters and knowledge: Local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography*, *28*(1), 31–56. https://doi.org/10.1191/0309132504ph469oa

Bathelt, H., Cantwell, J. A., & Mudambi, R. (2018). Overcoming frictions in transnational knowledge flows: Challenges of connecting, sense-making and integrating. *Journal of Economic Geography*, *18*(5), 1001–1022. https://doi.org/10.1093/jeg/lby047

Baum, T. (2002). Skills and training for the hospitality sector: A review of issues. *Journal of Vocational Education and Training*, *54*(3), 343–354. https://doi.org/10.1080/13636820200200204

Berliner, B. (1997). *What it takes to work together: The promise of educational partnerships*. Knowledge Brief. No. 14. WestEd.

Bianet Castellanos, M. (2010). Cancún and the campo. Indigenous migration and tourism development in the Yucatán Peninsula. In D. Berger & A. G. Wood (Eds.), *Holiday in Mexico. Critical reflections on tourism and tourist encounters* (pp. 241–284). Duke University Press. https://doi.org/10.2307/j.ctv11cw4hv.13

Billett, S. (2000). Defining the demand side of VET: Industry, enterprises, individuals and regions. *Journal of Vocational Education and Training, 50*(1), 5–30. https://doi.org/10.1080/13636820000200104

Billett, S., & Seddon, T. (2004). Building community through social partnerships around vocational education and training. *Journal of Vocational Education and Training*, *56*(1), 51–68. https://doi.org/10.1080/13636820400200245

Billett, S., Ovens, C., Clemans, A., & Seddon, T. (2007). Collaborative working and contested practices: Forming, developing and sustaining social partnerships in education. *Journal of Education Policy*, *22*(6), 637–656. https://doi.org/10.1080/02680930701625288

Bogner, A., Littig, B., & Menz, W. (2009). Introduction: Expert interviews – an introduction to a new methodological debate. In A. Bogner, B. Littig & W. Menz (Eds.), *Interviewing experts* (pp. 1–13). Palgrave Macmillan UK. https://doi.org/10.1057/9780230244276_1

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Brenner, L., & Aguilar, A. G. (2002). Luxury tourism and regional economic development in Mexico. *The Professional Geographer*, *54*(4), 500–520. https://doi.org/10.1111/0033-0124.00346

Brown, P., Green, A., & Lauder, H. (2001). *High skills. Globalization, competitiveness and skill formation.* Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199244188.001.0001

Budría, S., & Telhado-Pereira, P. (2009). The contribution of vocational training to employment, job-related skills and productivity: Evidence from Madeira. *International Journal of Training and Development*, *13*(1), 53–72.

Callan, V., & Ashworth, P. (2004). *Working together. Industry and VET provider training partnerships*. National Centre for Vocational Education Research.

Cantwell, J., Dunning, J. H., & Lundan, S. M. (2010). An evolutionary approach to understanding international business activity: The co-evolution of MNEs and the institutional environment. *Journal of International Business Studies*, *41*, 567–586. https://doi.org/10.1057/jibs.2009.95

Carte, L., McWatters, M., Daley, E., & Torres, R. (2010). Experiencing agricultural failure: Internal migration, tourism and local perceptions of regional change in the Yucatan. *Geoforum*, *41*(5), 700–710. https://doi.org/10.1016/j.geoforum.2010.03.002

Davies, B., & Hentschke, G. (2006). Public-private partnerships in education: Insights from the field. *School Leadership and Management*, *26*(3), 205–226. https://doi.org/10.1080/13632430600736977

Deissinger, T. (2010). Dual system. In P. Peterson, E. Baker & B. McGaw (Eds.), *International encyclopedia of education* (3rd ed., pp. 448–454). Elsevier.

Dyer, J. H., & Chu, W. (2000). The determinants of trust in supplier-automaker relationships in the U.S., Japan, and Korea. *Journal of International Business Studies*, *31*(2), 259–285. https://doi.org/10.1057/palgrave.jibs.8490905

Emmenegger, P., Graf, L., & Trampusch, C. (2019). The governance of decentralised cooperation in collective training systems: A review and conceptualisation. *Journal of Vocational Education & Training*, *71*(1), 21–45. https://doi.org/10.1080/13636820.2018.1498906

Evans, K., Hodkinson, P., Rainbird, H., & Unwin, L. (2006). *Improving workplace learning*. Routledge.

Federal Institute for Vocational Education and Training. (BIBB) (n.d.). *Germany supports the continued development of dual education and training in Mexico*. BIBB.

Federal Institute for Vocational Education and Training. (BIBB) (2015). *New alliance in German-Mexican vocational education and training cooperation*. BIBB.

Federal Ministry of Education and Research. (BMBF) (2013). *Strategiepapier der Bundesregierung: Berufsbildungszusammenarbeit aus einer Hand vom 5. Juli 2013*.

Fortwengel, J., & Jackson, G. (2016). Legitimizing the apprenticeship practice in a distant environment: Institutional entrepreneurship through inter-organizational networks. *Journal of World Business*, *51*(6), 895–909. https://doi.org/10.1016/j.jwb.2016.05.002

Fürstenau, B., Pilz, M., & Gonon, P. (2014). The dual system of vocational education and training in Germany – what can be learnt about education for (other) professions. In S. Billett, C. Harteis & H. Gruber (Eds.), *International handbook of research in professional and practice-based learning* (pp. 427–460). Springer. https://doi.org/10.1007/978-94-017-8902-8_16

German Committee on Education System. (1966). *Empfehlungen und Gutachten des Deutschen Ausschusses für das Erziehungs- und Bildungswesen 1953–1965*. Gesamtausgabe. Ernst Klett.

German Education Council. (GEC) (1974). *Gutachten und Studien der Bildungskommission. Die Bedeutung verschiedener Lernorte in der beruflichen Bildung*. Ernst Klett.

German-Mexican Chamber of Industry and Commerce. (CAMEXA) (n.d.). *El modelo Mexicano de la formación dual*. https://mexiko.ahk.de/es/dual/formacion-dual-mexicana

Gessler, M. (2017a). The lack of collaboration between companies and schools in the German dual apprenticeship system: Historical background and recent data. *International Journal for Research in Vocational Education and Training, 4*(2), 164–195. https://doi.org/10.13152/IJRVET.4.2.4

Gessler, M. (2017b). Educational transfer as transformation: A case study about the emergence and implementation of dual apprenticeship structures in a German automotive transplant in the United States. *Vocations and Learning*, *10*(1), 71–99. https://doi.org/10.1007/s12186-016-9161-8

Glückler, J. (2007). Geography of reputation: The city as the locus of business opportunity. *Regional Studies, 41*(7), 949–961. https://doi.org/10.1080/00343400601145194

Glückler, J. (2014). How controversial innovation succeeds in the periphery? A network perspective of BASF Argentina. *Journal of Economic Geography*, *14*(5), 903–927. https://doi.org/10.1093/jeg/lbu016

Glückler, J., Németh, S., & Melot de Beauregard, P. (2011). Netzwerke: Rechtsformen und Folgen für die Zusammenarbeit von Unternehmen. *Der Betrieb*, *64*(48), 2701–2709.

Gonon, P. (2013). What makes the dual system to a dual system? A new attempt to define VET through a governance approach. *bwp@, 25*. http://www.bwpat.de/ausgabe25/gonon_bwpat25.pdf

Graf, L., Powell, J. J. W., Fortwengel, J., & Bernhard, N. (2014). *Dual study programmes in global context: Internationalisation in Germany and transfer to Brazil, France, Qatar, Mexico and the US*. DAAD. Ditges print+more gmbh.

Graf, L., & Powell, J. J. W. (2017). How employer interests and investments shape advanced skill formation. *Cambridge University Press*, *50*(2), 418–422. https://doi.org/10.1017/S1049096516002936

Harris, R., & Deissinger, T. (2003). Learning cultures for apprenticeships: A comparison of Germany and Australia. Searle, J. et al. (Eds.), *Enriching learning cultures: Proceedings of the 11th annual international conference on post-compulsory education and training*, *2*, 23–33. Australian Academic Press.

Hollstein, B. (2011). Qualitative approaches. In J. Scott & P. J. Carrington (Eds.), *The sage handbook of social network analysis* (pp. 404–416). SAGE Publications Ltd.

International Labour Organization. (ILO) (2011). *A skilled workforce for strong, sustainable and balanced growth. A G20 strategy*. International Labour Office.

Kanter, R. M. (1994). Collaborative advantage: The art of alliances. *Harvard Business Review*, *72*(4), 96–108.

Kis, V., Hoeckel, K., & Santiago, P. (2009). *OECD reviews of vocational education and training: Learning for jobs review of Mexico 2009*. OECD Publishing. https://doi.org/10.1787/20777736

Krzywdzinski, M., & Jo, H. J. (2020). Skill formation, automation and governance: Comparing German and Korean automotive manufacturers in central-eastern Europe. *Critical Perspectives on International Business*.

Kuckartz, U. (2014). *Qualitative text analysis. A guide to methods, practice & using software*. SAGE Publications Ltd. https://dx.doi.org/10.4135/9781446288719

Lassnigg, L. (2017). Apprenticeship policies coping with the crisis: A comparison of Austria with Germany and Switzerland. In M. Pilz (Ed.), *Technical and vocational education and training: Issues, concerns and prospects* (pp. 127–148). Springer. https://doi.org/10.1007/978-3-319-47856-2_7

Lewis, T. (2007). The problem of cultural fit – what can we learn from borrowing the German dual system? *Compare: A Journal of Comparative and International Education, 37(4)*, 463–477. https://doi.org/10.1080/03057920701366408

López, A. M. (2020a). *Tourism in Latin America – statistics & facts*. STATISTA. https://www.statista.com/topics/2068/travel-and-tourism-industry-in-latin-america/

López, A. M. (2020b). *International tourism revenue in Latin America in 2017 and 2018, by subregion*. STATISTA. https://www.statista.com/statistics/305468/international-tourism-receipts-of-latin-america-by-region/

Markowitsch, J., & Wittig, W. (2020). Understanding differences between apprenticeship programmes in Europe: Towards a new conceptual framework for the changing notion of apprenticeship. *Journal of Vocational Education & Training*. https://doi.org/10.1080/13636820.2020.1796766

Mitchell, A. (1998). *Strategic training partnerships between the State and enterprises*. International Labour Office.

Mohrenweiser, J., Zwick, T., & Backes-Gellner, U. (2013). *Discussion paper no. 13-037. Poaching and firm-sponsored training: First clean evidence*. Centre for European economic research.

Muehlemann, S., & Wolter, S. (2011). Firm-sponsored training and poaching externalities in regional labor markets. *Regional Science and Urban Economics, 41*(6), 560–570. https://doi.org/10.1016/j.regsciurbeco.2011.04.003

Organisation for Economic Co-operation and Development. (OECD) (2017). *Tourism policy review of Mexico, OECD studies on tourism*. OECD Publishing. http://dx.doi.org/10.1787/9789264266575-en [21.03.2020]

Organisation for Economic Co-operation and Development. (OECD) (2018). *OECD reviews of vocational education and training. Seven questions about apprenticeships. Answers from international experience*. OECD Publishing. https://www.oecd-ilibrary.org/docserver/9789264306486-en.pdf?expires=1604925683&id=id&accname=ocid41021573&checksum=B1A09A6FDA7DCCE9FDBFF3C30C47C0CB

Peters, S. (2019). *Bildungstransfer im Unternehmenskontext*. Springer VS. https://doi.org/10.1007/978-3-658-25819-1

Pilz, M. (2016). Typologies in comparative vocational education: Existing models and a new approach. *Vocations and Learning, 9*(3), 295–314. https://doi.org/10.1007/s12186-016-9154-7

Pilz, M. (2017). Policy borrowing in vocational education and training (VET) – VET system typologies and the "6 p strategy" for transfer analysis. In M. Pilz (Ed.), *Vocational education and training in times of economic crisis. Lessons from around the world* (pp. 473–490). Springer International. https://doi.org/10.1007/978-3-319-47856-2_26

Pilz, M., & Fürstenau, B. (2019). Duality and learning fields in vocational education and training: Pedagogy, curriculum, and assessment. In Guile, D. & Unwin, L. (Eds.), *The wiley handbook of vocational education and training* (pp. 311–327). Wiley. https://doi.org/10.1002/9781119098713.ch16

Pilz, M., & Li, J. (2014). Tracing teutonic footprints in VET around the world? The skills development strategies of German companies in the USA, China and India. *European Journal of Training and Development, 38*(8), 745–763.

Pilz, M., & Wiemann, K. (2021). Does dual training make the world go round? Training models in German companies in China, India and Mexico. *Vocations and Learning, 14*(1), 95–114. https://doi.org/10.1007/s12186-020-09255-z

Ponds, R., van Oort, F., & Frenken, K. (2009). Innovation, spillovers and university–industry collaboration: An extended knowledge production function approach. *Journal of Economic Geography, 10*(2), 231–255. https://doi.org/10.1093/jeg/lbp036

Porter, M. (1998). Cluster and competition: New agendas for companies, government and institutions. In M. Porter (Ed.), *On competition* (pp. 197–299). Harvard Business School Press.

Raggatt, P. (1988). Quality control in the dual system of west Germany, *Oxford Review of Education, 14*(2), 163–185.

Reyes Miranda, F., & Cazal Ferreira, A. (2009). Migrantes reciente y nuevas ciudades. El caso de cancún, Mexico. *XXVII Congreso de la asociación Latinoamericana de sociología. VIII Jornadas de sociología de la universidad de Buenos Aires*. Asociación Latinoamericana de sociología. http://cdsa.aacademica.org/000-062/751.pdf/

Schneider, S., & Pilz, M. (2019). The function and institutional embeddedness of polytechnics in the Indian education system. *International Journal for Research in Vocational Education and Training, 6*(3), 284–308. https://doi.org/10.13152/IJRVET.6.3.5

Secretaría de Educación Media Superior. (SEMS) (n.d.). *Metodología y criterios para la implementación de los programas de formación dual*. http://www.sems.gob.mx/work/models/sems/Resource/12345/2/images/Metodologia-y-criterios-para-implementacion.pdf

Secretaría de Turismo. (SEDETUR) (2018). *Actividad Hotelera en México por categoría (anual)*. https://www.datatur.sectur.gob.mx/ITxEF/ITxEF_QROO.aspx

Secretaría de Turismo. (SEDETUR) (n.d.). *Misión y visión*. https://qroo.gob.mx/sedetur/mision-y-vision/

Secretaría de Turismo. (SEDETUR) (2019). *¿Cómo vamos en turismo de Quintana Roo? Período de enero-septiembre 2019 vs 2018*. http://sedeturqroo.gob.mx/ARCHIVOS/COMO_VAMOS_ENERO_SEPTIEMBRE_2019.pdf

Secretaría de Turismo. (SEDETUR), & Instituto Nacional de Estadística y Geografía (INEGI) (2020). *Empleo turístico*. https://www.datatur.sectur.gob.mx/SitePages/ResultadosITET.aspx

Smith, E. (2019). Apprenticeships and 'future work': Are we ready? *International Journal of Training and Development, 23*(1), 69–88. https://doi.org/10.1111/ijtd.12145

Statista. (2018). *Number of international visitors in the most popular Latin American city destinations in 2018*. https://www.statista.com/statistics/310542/overnight-visitors-to-top-latin-american-city-destinations/

Statista. (2020). *Number of international tourists in Cancun, Mexico from 2016 to 2025*. https://www.statista.com/statistics/805974/number-international-tourists-cancun/

Thelen, K. (2004). *How institutions evolve*. Cambridge University Press. https://doi.org/10.1017/CBO9780511790997

Torres, R. M., & Momsen, J. D. (2005a). Gringolandia: The construction of a new tourist space in Mexico. *Annals of the Association of American Geographers, 95*(2), 314–335. https://doi.org/10.1111/j.1467-8306.2005.00462.x

Torres, R. M., & Momsen, J. D. (2005b). Planned tourism development in Quintana Roo, Mexico: Engine for regional development or prescription for inequitable growth? *Current Issues in Tourism, 8*(4), 259–285. https://doi.org/10.1080/13683500508668218

Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational Research Review, 3*(2), 130–154. https://doi.org/10.1016/j.edurev.2007.12.001

Valiente, O., & Scandurra, R. (2017). Challenges to the implementation of dual apprenticeships in OECD Countries: A literature review. In M. Pilz (Ed.), *Vocational education and training in times of economic crisis. Lessons from around the world* (pp. 41–57). Springer International. https://doi.org/10.1007/978-3-319-47856-2_3

Vogelsang, B., & Pilz, M. (2021). Conditional factors for training activities in Chinese, Indian and Mexican subsidiaries of German companies. *European Journal of Training and Development, 45*(4/5), 419–435.

Wiemann, J., & Fuchs, M. (2018). The export of Germany's 'secret of success' dual technical VET: MNC and multiscalar stakeholders changing the skill formation system in Mexico. *Cambridge Journal of Regions, Economy and Society, 11*(2), 373–386. https://doi.org/10.1093/cjres/rsy008

Wrana, J., & Revilla Diez, J. (2016). Can multinational enterprises introduce new institutions to host countries? An explorative study about MNEs' training programs with educational institutes and their potential influence on Vietnam's vocational education sector. *Geographische Zeitschrift, 104*(3), 158–182.

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Social Representation of Non-Academic Work in Mexico in the Light of Cultural Artefacts

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Abstract

Context: Technical and Vocational Education and Training (TVET) has attracted increasing interest in recent years due to its potential to address productivity and equity challenges, such as better employment prospects, as outlined in the United Nations Sustainable Development Goals (SDGs). Despite the potential of such programmes, the enrolment rate in vocational training at upper secondary level in Mexico is 38.2%, i.e. below the Organisation for Economic Cooperation and Development (OECD) average of 45.7%. This raises the question of possible reasons for the low enrolment rate.

Approach: Based on the assumption that attitudes towards non-academic work are culturally anchored in Mexican society, which also shapes the educational and career aspirations of younger generations, the project named Cultural Practice of Non-academic Work in Mexico (KuPraMex), funded by the German Federal Ministry of Education and Research (BMBF), investigates social representations of non-academic work in Mexico. This is done through the analysis of artefacts such as films, murals, etc., as these are part of the tangible culture of a society. As materialised products of human activities or cultural practices, artefacts can be understood as objectifications of social relations and conditions. Therefore, in this context, it is assumed that through the analysis of cultural artefacts, a deeper understanding of how non-academic work is thought, felt, and valued in Mexican society will emerge.

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Findings: It has been found that the topic on non-academic work is often associated with informality. Moreover, the representations and narratives in cultural artefacts often show that non-academic work, apart from office work, is physically challenging but cognitively undemanding. In terms of access to a company, social networks seem to have enormous relevance. Hierarchies seem rigid and opportunities for promotion limited. However, narratives with more positive attributions regarding non-academic work can also be identified, which state that young people experience a habitus transformation through work.

Conclusion: Nevertheless, non-academic work in Mexico seems to lack prestige, which may affect young people's educational and career aspirations and choices. This could mean that those who can afford it prefer to pursue a career in tertiary education rather than opt for a TVET programme. At the macro level, the mentioned lack of prestige could hamper attempts to offer such programmes.

Keywords: Vocational Education and Training, VET, Non-Academic Work, Artefacts, Social Representation, Mexico, Culture

1 Non-Academic Work From a Culturally Informed Perspective

Educational politics often seem to target mainly academic education and university degrees. However, the productivity of a society also – and literally – lies in the hands of blue-collar workers and administrative staff. In this article, labour in production, agriculture, health, tourism and other services or administration which require competences not acquired in universities, will be subsumed under the umbrella term of *non-academic work*. There is a lot of evidence that Technical and Vocational Education and Training (TVET) investment pays off, not only in terms of social effects and increased efficiency of economies, but also in terms of individual wages (Almeida et al., 2015; Icardi, 2021; OECD, 2019). Nevertheless, when it comes to formal educational and career aspirations, non-academic labour is sometimes perceived as a second-best choice. Young people and their families in many South American countries show little inclination for vocational training and artisan careers. Also, for Mexico, the Organisation for Economic Cooperation and Development (OECD, 2019) reports that despite the potential of TVET programmes mentioned above, the enrolment rate in vocational programmes at upper secondary level is only 38.2%, below the OECD average of 45.7%. This phenomenon, sometimes labelled as *white-collar syndrome*, may lead to serious mismatches between educational systems and labour market, and hence has severe repercussions for economies, companies, and individuals (Almeida et al., 2015).

Often, biographical decisions are not very rational. We visualise our potential future based on fantasies, experiences and emotions, rather than figures and empirical projections. If educators and policymakers want to understand (and perhaps influence) educational decisions,

it is therefore necessary to understand culturally shaped and therefore irrational-seeming motives that underlie the decisions. This is especially important in a time when the power of family traditions in career choices seem to diminish in many communities.

The culturally anchored picture of *normal* work helps people to guide their career decisions and to coordinate their educational efforts. Normality assumptions provide the foundation of how people look for work, integrate themselves into the world of labour, and submit to work requirements or defend themselves against unreasonable demands. In this way, the normality assumption of work is both the result of social action, and its guideline. Such cultural patterns are "rooted in societies" (Becker, 2004; Giesecke & Wotschack, 2009), even though – as social phenomena – they can also be the subject of changes and social dynamics (with regard to Germany cf. e.g. the contributions to Behringer, 2004; Brose & Wohlrab-Sahr, 2018 or Voß, 1998).

Assumptions about normality regarding labour are not only directed to specific working places or jobs (i.e. referring to the question of how it is to work as a plumber, electrician or nurse), they are also based on institutionalised structures and rules of labour markets. Our beliefs regarding the quality of a workspace, income, career chances, etc. depend on how normality of workspaces, income and career chances are constructed and passed on in institutionalised surroundings.

However, in the study presented here on social representations of work in Mexico which is part of the project entitled Cultural Practice of Non-Academic Work in Mexico (KuPraMex) supported by the German Ministry of Education and Research (BMBF), we are keen to dig even deeper and to find out more about thoughts, beliefs, and emotions, which are culturally bound to certain non-academic jobs. We want to understand how people of the cultural context of Mexico perceive non-academic work. In order to do so, in a first step we analyse cultural artefacts such as films, murals, etc. because they belong to tangible culture of a society. We want to better understand the central core of social representations in Mexican society, especially of the youth, regarding non-academic work.

What contributions can such a culturally informed perspective bring to comparative vocational education research on a scientific level? On first sight, this question does not seem very reasonable nowadays. Comparative vocational education research has been withdrawing from cultural topics since the turn of the millennium. In view of the globalisation of population movements and production sites, it seems more appropriate to focus less on conditions and more on the results of vocational education and training: Competencies. Even before experts in Europe started to design, discuss, and coordinate a European competency framework, systems for the recognition of previously acquired competences and their classification into competency frameworks had been created in Chile, Argentina, Colombia and Mexico.

The reasoning was compelling: If it no longer matters in which institution and in what period of time a competence is acquired, but only what a person knows and can do, then people could be appropriately allocated across system boundaries. Moreover, if competencies could become the one and most important currency in labour market, social borders – for example, between general and vocational education system or between informal and formal education – could also be overcome.

Despite its merits, the debates about competency frameworks had a completely unintended effect: Comparative research into vocational education came out of focus due to the concentration on the output. In the 1980s and 1990s, there had been endeavours to analyse foreign systems of vocational education for shedding new light on one's own (see the fundamental considerations at Lauterbach, 1994; studies such as Georg, 1997; or the systematisation at Deißinger & Frommberger, 2010). As well, research in Latin America such as Arnold (1989), Clement (1999a), Greinert (1997), Lehner (1994), Wallenborn (2001) and Wolf (2011), was barely followed up. Studies on the informal sector (for a summary see Bayón, 2008) were overshadowed by the promise that the competence orientation would overcome even these barriers between formal and informal sectors.

Since the euphoria regarding the competence frameworks has been slowly subsiding (Clement, 2016), comparative vocational researchers have been re-establishing the earlier traditions. For Latin America, more recent research restoring these traditions comprise, for example Clement and Oelsner (2016), Oelsner and Richter (2015), Schoenstedt-Maschke (2013), Sevilla (2017) and more specifically for Mexico, for example Cáceres-Reebs and Schneider (2013) as well as Wiemann (2018).

Nevertheless, the criticism of competence orientation has also left its mark on comparative educational research. If training and employment systems are analysed by describing institutional structures (types of school, certificates, authorisation systems) and empirical data (labour market, education), something essential is missing – this has become increasingly clear. Sociological concepts such as the description of labour market regimes and governance, or psychological approaches, for example on professional identity or self-concept, indicate that there are also social connections beyond the level of institutions and structures that make the interaction between education and the labour market work. The complex coordination between educational and career aspirations and selection, labour market and allocation, demand and supply, norms, interests and emotions, state, private and individual action, etc. cannot be understood only by the precise description of structures. People do not make decisions (e.g. when choosing a profession, selecting personnel, etc.) as the bottom line of a structure. Rather, they have socially shaped perceptions, normality assumptions, expectations and values based on their own culture, in which such structures (often shortened) are condensed and reflected, but not exhausted. In this way, a culturally informed perspective is highly promising for analysing non-academic work in a country like Mexico.

2 Context of Young People in Mexico

Both conceptions of non-academic work and work itself are social constructions that develop in a socio-historical context. Currently, this topic has gained relevance in academic circles and in the world of work due to the profound transformations in organizational and technological changes that have been taking place. The causes of these changes are attributed to policies that favoured deregulation, flexibilization and the incorporation of new technologies. As a consequence of a successive implementation of the neoliberal model, young people are not only prevented from accessing an occupation or professional profile, but they enter the world of work in a globalized market characterized by uncertainty and instability and are exposed to high rates of unemployment and job insecurity today.

The choice of young people as the unit of analysis responds to the need not to fall into universalism when approaching the relationship between subjects and work. Youth is considered as a socio-cultural category, of which duration and characteristics are determined by the respective society. "[Y]outh and age are not self-evident data but are socially constructed, in the struggle between the young and the old" (Bourdieu, 1993, p. 95). Youth has become a focus of interest in social studies, and it represents a particularly interesting object of investigation in a society in which social representation of non-academic work seems to be reformulating. Whereas young people suffer from exclusion from parts of the labour market, many of them are forced to work at early age, also as a result of the conditions of poverty.

The main people affected by unemployment in Mexico are young people. Official numbers show that the majority of those who cannot find work are between 14 and 29 years. One tenth of young people are unemployed. The problem is aggravated by the fact that one out of four people in the country is young and young people represent one third of the economically active population (EAP, calculated at 47 million 131 thousand 536 individuals) (INEGI, 2020). Due to low economic growth and insufficient labour market policies, the country could not effectively incorporate youth into the formal labour market. This leads to a loss of social and economic capital, and to young people being forced to work at young age and without social and labour protection, making them subject to precarious conditions.

This makes young people face various exclusion situations: Exclusion from the labour market due to the barriers they find; economic exclusion due to their inability to generate income; institutional exclusion due to the lack of support from state programs; cultural exclusion due to the inability to live in accordance with socially accepted norms and values. In summary, working conditions can be assumed to have an impact on the significations of non-academic work among young people, taking into account that work is an activity that generates significance. The meanings attributed to work vary from one society to another and over time, since they are determined by historical, social and cultural variables.

3 Non-Academic Work and its Social Representation as Fields of Investigation

Economic research points out that labour markets and corporate actions should also be analysed against the background of socio-cultural differences. For example, Sagiv and Schwartz (2007) formulated that organisations are shaped by the societies around them, the personal values and priorities of their members, and the type of core tasks of the organisation. Cameron and Quinn (2006) developed their "Competing Values Framework" based on empirical studies on the characteristics of organisational culture and extensive factor analyses. Wolf et al. (2011) proposed an analytic scheme specifically related to the relationship between vocational training and the labour market. It describes six dimensions (labour regime, labour law, technology, collective actors, social security, and institutional order), which helps to describe the work-cultural background of employment qualification.

Research and practice have acknowledged the importance of working individuals for organisational and business success for a long time. On the research side, evidence exists that a committed workforce that is more likely to engage in learning leads to improved business performance (Cillo et al., 2019), and other organisational performance indicators such as decreased turnover intention (Santhanam & Srinivas, 2019). Work identity, job satisfaction, competence acquisition, as well as commitment and engagement of blue-collar workers are critically connected to the societally shared and culturally anchored picture of their jobs as well as the employment-structuring institutions such as recruitment regimes, remuneration schemes and control systems (Pries, 2010).

In this light, the subject of analysing social representations of non-academic work in Mexico through various forms of cultural artefacts gains its particular relevance not only for TVET research but also organisational research and business practice. Understanding the cultural and institutional underpinning of blue-collar jobs may help workers engage in techniques of self-affirmation (Elsbach, 2003) that enhance their cognitive performance and their decision-making (Hall et al., 2014). At the same time, knowledge about the ideas and cultural significance workers hold about the jobs they carry out may guide organisations and managers in facilitating so-called holding environments; such holding-environments provide psychological safety and may help workers cope with threats of financial insecurity, harassment and other assaults to a person's integrity and dignity (Kahn, 2001). Finally, cultural analyses of blue-collar jobs, together with the work relations they are embedded in, may inform effective control and appraisal systems that lead to worker motivation and empowerment rather than a dichotomy of compliance or resistance (Curchod et al., 2019), both of which do not entail worker engagement in their jobs.

4 Social Representations and the Relevance of Cultural Artefacts

The aim of the BMBF-funded project KuPraMex is to find out which collectively shared images, conceptions, ideas and knowledge concerning non-academic work dominate in Mexican society, composed of individuals of all ages. However, the focus in this context is primarily on young people who are before or in transition to working life and must make educational and career choices in line with their collectively shared ideas, images, values and cultural significance.

It is precisely these collectively shared ideas, images, meanings and values that are closely associated with the concept of culture. The first definition of the term culture at the end of the 19th century, made by Tylor (1891, p. 1), states that culture "in the broad ethnographic sense, is that complex whole which includes knowledge, beliefs, art, morals, law, customs, and all other habits and capacities acquired by man as a member of society", i.e. the tangible and intangible manifestations of society. The conceptualisation of the term has since been discussed in numerous disciplines[1] . The differentiation between tangible and intangible culture leads us to recognise the symbolic character of culture, in which symbols and meanings are the framework of social action and according to Geertz (1973, p. 89) culture is understood as "a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes towards life", as to say "a web of meanings". The analysis of culture must therefore be an interpretative science in search of these meanings, which for us are expressed through cultural artefacts and the social representations that society develops precisely about them.

In this respect, the concept of social representations – introduced into social psychology by Moscovici in the early 1960s – proves to be particularly valuable. This is because, as the following citation shows, the concept focuses on the elementary form of social knowledge (Araya Umaña, 2002; Schützeichel, 2007):

> *"Social representations […] concern the contents of everyday thinking and the stock of ideas that gives coherence to our religious beliefs, political ideas and the connections we create as spontaneously as we breathe. They make it possible for us to classify persons and objects, to compare and explain behaviours and to objectify them as parts of our social setting" (Moscovici, 1988, p. 214).*

Moscovici (1988) sees social representations as a component of social organisation that also frames the perception of individuals in relation to social structures and performative acts. The extent to which social reality is dependent on the particular framework of interpretation is made clear by the example of drug use. It can be perceived as a collapse of a family or a religious ceremony, as in several Mexican indigenous cultures. Consequently, social

[1] See the article by Kroeber and Kluckhohn (1952) in which more than 164 definitions of the concept of culture were collected and summarised, as well as the discussion of the conceptualisation of the term culture in the context of indigenous cultures in Mexico by Mendoza et al. (2020).

representations are always context-dependent and expressing the cultural values, beliefs and symbols. In addition, they represent dynamic entities that are constantly updated by performative acts. At the same time, social representations have a certain autonomy in the production of meaning (Moscovici, 1988; Schützeichel, 2007). In other words, social representations to a certain extent lead "a life of their own" (Moscovici & Duveen, 2001). Moreover, social representations are attributed to the function of transforming the unknown into the familiar: The so-called process of "anchoring" (Moscovici, 1988; Araya Umaña, 2002).

Considering the fact that the concept of social representations unites pairs of opposites, it sometimes seems paradoxical. Social representations are stable with simultaneous instability, rigid and fluid, etc., which is why Abric (1993) divides them into a central core and peripheral elements. The peripheral elements refer to those aspects of social representations that are characterised by flexibility and mobility. Consequently, peripheral elements are directly related to an individual's experiences, and constitute an interface between the outside world and the central core. At the same time, they act as protective shields, preventing the central core, to a certain extent, from change. For example, repetitive experiences or profound impacts that deviate from the central core may change it. In general, however, the central core of social representations is characterized by relative stability[2].

However, the concept is not limited exclusively to those social representations "which are formed by the medium of language" (Schützeichel, 2007, p. 451; *translation by the authors*), but increasingly considers visual knowledge as well as the material world and the artefacts existing in it (Moscovici, 1988; Schützeichel, 2007). Artefacts are objects that are created, used, or modified by means of human action (Lueger & Froschauer, 2018). In other words, "artefacts as materialized products of human action [...] embody objectivations of social relations and social conditions; they represent the activities by which they were created" (Lueger, 2010, p. 92; *translation by the authors*). Accordingly, artefacts are – consciously or unconsciously – placed in the material world by humans and form part of the tangible culture. However, their creation does not remain without consequences in the social world either but has an effect on the thoughts and interaction of individuals as externalisation of humans (Lueger, 2010; Lueger & Froschauer, 2018). Consequently, people live in a material world, which is partly created by them, but also influences their social world and vice versa (see following figure).

[2] Against the background of the relatively stable constitution of the central core, Abric (1993) recognizes a certain connectivity to the approach of collective memory. According to Erll (2017), this concept has become one of the most widely discussed in cultural studies memory research. Assman's (1988) concept of collective memory is constituted by communicative and cultural memory. In this context, however, the approach of collective memory will not be discussed further.

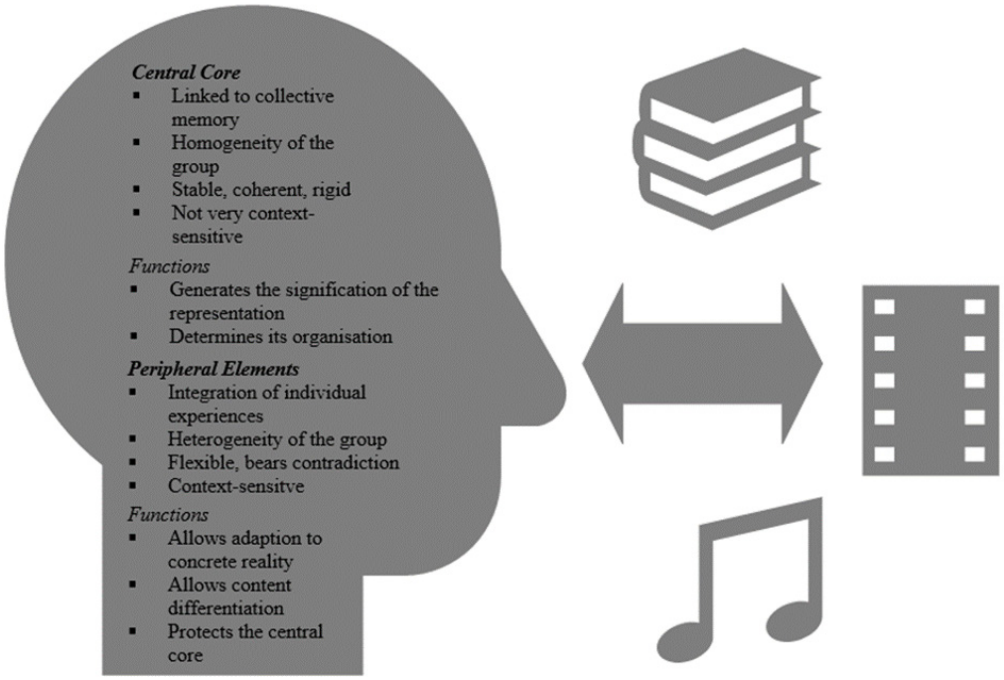


Figure 1: Reciprocity Between Individuals and Artefacts (own elaboration according to Abric, 1993)

Given the demonstrated interaction between social representations and produced artefacts, the social relevance of artefacts is undeniable. Accordingly, social distinction can be established through dress codes, value systems or the meaning of non-academic work can be manifested in different types of cultural artefacts. Given their prominent social relevance, the inclusion of artefacts in social analyses is important. Even more, a broader understanding of culture and society is only possible through a combination of language-based methods, like interviews, and artefact analysis (Lueger & Froschauer, 2018). A study of cultural artefacts can provide clues to the patterns as well as the central core of social representations of a society composed of individuals of all ages. This was done for the cultural context of Mexico. The methodological approach will be described in the following section.

5 Methodical Approach

The artefact analysis proceeds along four phases (see Figure 2).



Figure 2: Working Process of the Artefact Analysis (own elaboration)

In the *first phase*, a pre-selection of cultural artefacts as social representations of non-academic work took place. In the context of this study, cultural artefacts are primarily understood as those that transport narratives or forms of representation of non-academic work, such as films, murals, songs, etc.; however, tools from working contexts are not considered as cultural artefacts. The search was not limited to a specific type of cultural artefact because there was ex-ante uncertainty about whether and to what extent the topic of non-academic work could be found in artefacts. In this regard, Mexican film rankings, studies, etc. were included. For example, based on the 2017 study *Estudio de Consumo de Medios y Dispositivos entre Internautas Mexicanos*[3] (IAB, 2017), the artefact type of *Memes* was also included in the analysis. The cultural artefacts found were screened to see if they contained representations of work. So far, 77 artefacts have been sighted, which, after a pre-selection within the international research group, were subjected to further investigation and discussion to ensure that only artefacts significant for the purpose of the study were analysed, leading to the second phase of artefact analysis.

In the *second phase* of work, the artefacts to be analysed were narrowed down further. Thus, not only non-academic work in general should be represented, but particularly the areas of administration, gastronomy, tourism, and metallurgy. This is in line with Lueger and Froschauer (2018), who postulate that the selection of artefacts must be significant for answering the research question. Another criterion is related to the production of the respective artefact. Accordingly, a person originally from Mexico (or someone intimately familiar with Mexico) had to have produced the artefact; this was to ensure that the representation of non-academic work was framed according to the cultural context. Other selection criteria that were applied to the analysis material are listed below, whereby these can partly occur in combination, but must at least be contained individually.

[3] Study of media consumption and devices between Mexican Internet users (IAB,2017)

The artefact:

- Has a certain reach,
- Recurs in other contexts (recurrence),
- Has intertextual passages,
- Is up-to-date, or
- Occupies a place in the collective memory.

After filtering the 77 artefacts according to these criteria, 44 remained. Table 1 gives an overview over the types of artefacts included into the analysis.

Table 1: Types of Analysed Artefacts (own elaboration)

Artefacts	Category	Total
Movies	Comedy Drama	8
Documentaries	Cultural	5
Series	Comedy	7
Literary novels	Drama	4
Memes	Urban Myths Parody Mexican culture	3
Songs	Ranchera/Cumbia Hip-pop	2
Murals	History	8
Monument	Historical	1
Blog	Cultural	1
Talk-show	Cultural	1
Compendium Proverbs	Cultural	1
Essay	Books	2
Tele-Novela	Drama	1
Total		44

Due to diversity and heterogeneity of artefacts, it was necessary to develop different analysis patterns in the *third phase*. In this respect, the elaboration of the analysis patterns was guided by the key questions proposed by Lueger and Froschauer (2018) regarding the artefact's conditions of existence, the everyday contextual embedding of the meaning, distanced structural and descriptive analyses. Furthermore, reference was made to the German concept of *Beruf,* which served as a contrast to non-academic work (Clement, 1999b; Kutscha, 2008; Matthes

& Vicari, 2018), also making reference to Pries' (2010) conceptual reflections on the field of gainful employment. The comparison of non-academic work with the aforementioned German concept revealed differences that formed the starting point for generating specific questions that were added to the analysis pattern. In addition, depending on the type of artefact, we borrowed from other disciplines in some cases. For example, art scientific methods offered an adequate frame for analysing and interpreting e.g. murals (Held & Schneider, 2007). Figure 3 depicts an example of an analysis pattern for cinematic material. Finally, in the third phase, the analysis was done on the basis of the developed patterns.

Title:	
Author:	
Year:	
Genre:	
Entire Duration:	
Exact Location of Finding:	
Is work somehow a subject of discussion/ visualised in the material?	
Which sectors (e.g. tourism, gastronomy, metal technology, administration, etc.) are focused in the material?	
Describe the scene or the scenes referring to the following questions/topics! *(always mention the exact minute and duration for every scene)*	
Work Tasks *What does the person do?* *What kind of problems is she or he facing?* *How significant/critical are these problems for others/for society?* *What is the risk/the worst outcome if problem solution fails?*	
Who has interests in solving/not solving the problem? Who is involved in the working process?	
*How are the **Work Tasks** structured?* *(Highlight the appropriate term)*	Holistic / Fragmented Complex / Simple Problematic Task / Routinized Contextualised / Standardised Secially Relevant / Exploitation Interest
Competencies *Which knowledge does the working person show?* *What is she or he able to do? How are skills described or visible?* *On the base of which external signs/symbols do others recognize the competencies of this person?* *Where does the know-how or skills find limits?*	
Habitus *What is the working person proud of?* *How does their identity get visible?* *Which conditions/communication form does he or she accept? Which not?* *Which physical, verbal or physical expression does the identity of the working person show?* *Which traditions become visible?*	
Working Conditions *Which context conditions are visible, e.g. in terms of recruitment, pay, contractual basis, employment status, hierarchical position, promotion opportunities, gender etc.?*	
Institutions *Which institutions does the working person belong to? Which memberships are shown?*	

Figure 3: Example of an Analysis Pattern for Cinematic Material (own elaboration)

The perception of each individual (i.e. the subjective constructions of reality) is dependent on cultural as well as social positions and other factors such as age, gender, etc., while these aspects are hardly reflected in everyday life. There is a term in the scientific field that describes this phenomenon: Situatedness[4] (Kleemann et al., 2009). However, the phenomenon of situatedness does not only affect individuals outside the field of science, but also researchers. Consequently, at least two members, male and female, of the project team conducted the analysis of each artefact.

The analysis in teams of two was followed by the *fourth phase*, in which the processed patterns of analysis were discussed. Five to seven people regularly took part in the research group setting[5], with at least half of the participants coming from the respective cultural context, while the rest were from outside the context. In this way, blind spots resulting from situatedness could be eliminated or at least mitigated (Kleemann et al., 2009). Within the research group, narratives were reflected and hypotheses about the social representations of non-academic work were discussed and scrutinized. The assumption was that repetitive narratives, behaviours, etc. refer to socially shared knowledge and thus expose the central core of social representations.

6 Findings

Based on the analysis of our sample of 44 artefacts, we present and discuss its findings through a selection of cultural artefacts that have proved particularly telling regarding the perception of non-academic work in Mexico. The findings are presented along the categories of habitus, competences, and working conditions, as reflected in the analysis pattern (Figure 3). These three categories could be best illuminated by the analysis of our sample of cultural artefacts. Because of the findings' tentative and preliminary character, follow-on research will have to elaborate, corroborate, refute or refine them.

For the category of habitus, it showed that everyday language gives many hints regarding social representations within Mexican culture. Known expressions and phrases result from a mix of cultures which have formed the idiosyncrasy of Mexicans over time. Mexicans use innumerable phrases to express all types of emotions and actions, although there are some expressions that are used more or less according to the social class or environment of a particular person. With good humour and typical eloquence, regardless of age, gender or race, Mexicans often express their views and perceptions with phrases that they only understand. The most recurrent and emblematic phrase to represent work in Mexico is *chamba*[6]; that is

[4] Original German term: Standortgebundenheit.

[5] Besides the authors, Allistair Fritz López Mercado and Francisco Padilla Reyeros participate in this group.

[6] Chamba is used colloquially to call for a job in Central America, Ecuador and Mexico. One of the most widespread versions states that its origin dates back to the 1940s when the governments of Mexico and the United States reached a temporary agreement: Mexicans would go to work in U.S. fields, where men were scarce due to that country's participation in World War II. The treaty lasted from 1942 to 1964 (Ramos y Duarte, 1898).

to say the Mexican is not going to work, "but is going to chamber", not looking for work, but looking for *chamba*. In contrast to the more physical and informal *chamba*, academic work may be connoted with self-fulfilment, autonomy, a better standing in the social and organisational hierarchy or personal development. Meanwhile, non-academic labour in Mexican society is mainly seen as medium to survive in an often risky environment and is correspondingly less prestigious.

With respect to the positioning in the field of gainful employment, it becomes apparent that higher positions are, so to speak, hereditary and consequently tend to be reserved for individuals of higher social classes. In the film "Mirreyes vs. Godinéz", most employees, except for the protagonist (a young hard-working deputy director), accept this logic. When the owner dies unexpectedly, the son – without ever having worked, not to speak of having worked in that particular company – becomes the managing director or, colloquially, the *patrón*[7]. There seems to be a heavenly given order of things that provides every human being their position. Good workers will humbly accept this position and place: *"Dónde manda el capitán, no gobierna marinero*[8]*"*. The expression *"ser ubicado*[9]*"*, is widespread and often been used to describe a person's good character. In such a predetermined world, there is little point in being in a rush. *"No hay que comprar el fuete, antes que el caballo*[10]*"*, and *"no por mucho madrugar, amanece más temprano*[11]*"*.

Overall, the analysed artefacts indicate limited promotion opportunities. In this respect, individuals might feel resigned to a certain extent, which could have a demotivating effect. Especially non-academic work is perceived as a necessary, but laborious fact of life. Proverbial wisdom tells people to stay in their jobs even if it is linked to hardship, because having a job is precious in order to make ends meet. Even if payment is bad, the proverb says *"Cuando puedas trabajar, no lo dejes, aunque no te den lo que mereces*[12]*"*. This narrative is also taken up in other artefacts such as *Roberto Bolaño's* novel "Los Detectives Salvajes" and many of the analysed movies. As a result, the characters pursue the work activity out of material constraints, which means a purely pragmatic perspective of work.

Humour is a very telling cultural expression; by breaking expectations and rules it gives us important hints about what those implicit regularities are. If *Cantinflas* (a very well-known Mexican comedian from the 1950/60s, deeply anchored in the collective memory) is shown as a person who constantly avoids work and only accepts it in economic crises, he will gain the sympathy of all the people who feel they work for the money and not much else. In the famous series of "El Chavo del Ocho" from the 1970/80s, one of the main characters, *Don*

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[7] According to the Real Academia Española (2020), Patrón means; m. and f. Defender, protector. The word Patrón is culturally embedded in the Mexican context and is seen as a protector or paternal figure in companies.

[8] Where the captain is ruling, the sailor will not.

[9] Know what her or his place is.

[10] You do not have to buy the fort before the horse.

[11] No matter how early you get up, the sun won't rise.

[12] If you can work, do not leave it, even if they do not give you what you deserve.

Ramón, prefers to hide when the landlord comes to collect the rent rather than work and pay it off. Apart from the fact that it is an older series, the figure *Don Ramón* seems to be emblematic of the attitude and the avoidance of work. This is also illustrated by numerous *Memes* in circulation that take up this character in the light of such work topics. On the one hand, this fact underpins the assumption that some series, even though they are older, still have a certain actuality and are deeply anchored in the collective memory. On the other hand, it supports our thesis that the core of social representations on non-academic work are relatively stable and anchored in Mexican society, to which all age groups belong, also youth. Consequently, such cultural artefacts have descriptive and explanatory power with regard to the attitudes, thoughts and ideas of young people towards non-academic work.

While the character of *Don Ramón* is regarded with sympathy and a wide feeling of understanding, there are other people who avoid work, just because they can. In the more recent movies like "Nosotros los Nobles" or "Mirreyes vs. Godinez", it is clear that employment will be avoided, if social status allows it. Interestingly, there is an established term in Mexican society for the rich children of the Mexican economic elite, as the second film suggests: *Mirreyes* (meaning as much as *my kings*). The circulating narratives about the so-called *Mirreyes* tend to be negatively framed. Thus, they appear unpleasant, lazy and with a certain lack of empathy towards less well-situated people. However, the narratives show a change at the point where there is a need for the *Mirreyes* to work seriously. Through the work, they experience the moment of catharsis, so to speak, because the Mirreyes discard their attitudes, a habitus transformation takes place, which causes a change in culturally embedded values. And in the end, they also show solidarity with people from lower social classes.

As for the category of competences, we identified that being diligent, skilled and experienced comes to be one well-recognised way to maintain dignity in work. Like in many European cultures, we find proverbs about the importance of practice and perseverance in learning a trade. *"La práctica hace al maestro*[13]*"* or *"más sabe el diablo por viejo, que por diablo*[14] *"*. Being competent in Mexican society also includes the ability to manage difficult situations, improvising and finding solutions in nearly impossible situations. Improvisation plays a prominent role in Mexico's everyday life and work contexts. Films like "Grand Hotel I" or "Nosotros los Nobles" show with a lot of humour how Mexicans get out of difficult situations by accepting jobs, even in informality, and taking the most unlikely chances to improvise.

In terms of working conditions, many proverbs show physical work as demanding and dirty, in multiple ways comparing it with the duties of donkeys. In a society with a colonial background, which in important parts was shaped by large-scale agronomy and a sharp division between landowners and workers, the strict hierarchies are still perceptible today. These crystallise in numerous artefacts, such as in the movies "Roma" or "Buenos días Acapulco".

[13] Practice makes the expert.

[14] The devil knows more from age than from being a devil.

However, other artefacts, such as the murals of the artist Diego Rivera, focus on egalitarian social utopias, which propagate the breaking up of these anachronistic social structures while at the same time heroizing the worker. This kind of representation, however, is directly related to the ideology of the artist – he was an avowed communist.

Thus, despite some exceptions, strict hierarchies are evident in most artefacts. They also manifest themselves in the dressing habits of the people. In the cultural context of Mexico, however, the hierarchies also manifest themselves through the medium of language. This becomes clear from the colloquial terms *patrón* and *peón*. The term *patrón*, which is a traditional expression for a landowner, is even valid in the contemporary labour market, where almost every boss or company owner is still called *patron*.

In addition to the perceived hierarchies at the social and organisational level, it is striking that ascension within these is only possible, if at all, under difficulty. Moreover, filling higher positions within a company appears to be less based on meritocratic principles. Instead, it can be observed that the degree of kinship, including the for Mexican culture very important ritual kinship, described by Pries (2010) as compadrazgo-system, and gender play prominent roles. Another aspect which, up to a certain point, leads to promotion within the company seems to be the length of time they have been with the company. Consequently, the principle of seniority applies alongside the degree of kinship.

In Mexico, the culture of labour seems to be strongly embedded in social networks. A lot of proverbs about reciprocity and loyalty talk about favours. *"Entre bomberos no se pisan las mangueras*[15]*"* or *"tú que sabes y yo que sé, cállate tú que yo me callaré*[16]*"* are well known advices in Mexican society. The line between loyalty and complicity appears to be thin. Social networks also appear to be of immeasurable value in the recruitment and employment of personnel. In the novel "Los Detectives Salvajes" it is noticeable in various passages that a few characters in the novel tend to activate family, friends and/or acquaintances when looking for work. By means of social networks, the transition to a working relationship appears to be easier and more promising. The relevance of social capital on the threshold of employment seems to be enormously high. Furthermore, it is clear from the film "Nosotros los Nobles", for example, that the recommendations made mean double protection for the employer, as he or she has two contact persons at the same time. This increases social pressure and reduces possible misconduct of the newly hired employee. The phenomenon of social pressure is visible in numerous scenes of this film. When the female character (formerly a rich daughter) complains about the poor working conditions at the beginning of her employment, the person who recommended her holds her back. Furthermore, the recommender demands humility and gratitude for having given her a job in the first place that she has a job at all. She then rows back and accepts the poor working conditions. These are such that she recei-

[15] Between firemen, you do not step on the hoses.

[16] When you know and I know, you shut up and I'll shut up.

ves no basic salary and works only on the basis of tips. There is also no written employment contract, which could indicate that this is a normality assumption regarding non-academic work in Mexico. Apart from the employment conditions mentioned above, the female film character is obliged to wear a work uniform. She dislikes this very much, as the women's uniform, unlike the men's uniform, is quite provocative. This observation can also be made for other artefacts. According to this, differences between the sexes are manifested in terms of dress practices in the realm of work. For women, the principle of "sex sells" is therefore particularly common.

Besides the aforementioned dress practices, gender stereotypes play a strong role not only in cultural artefacts but also in Mexican everyday language. The frequent use of sexualised and sometimes cruel language to describe social positions or characterise situations, for example as the colloquial terms *chingón*[17] for good or *chingada*[18] for bad – as the novel "El Laberinto de la Soledad" of *Octavio Paz* states – may bewilder foreigners strongly. In cultural artefacts about labour, women are often shown as physically attractive, but rather useless in their job, or – on the contrary – overly dedicated to work and by this way neglecting private lives and partnership. In the film "Loca por el Trabajo" a working woman is successfully promoted, but harshly criticised of being too ambitious and "crazy for work". Although she is successful in her job and has achieved financial independence, she is considered a loser after her husband leaves her. This highlights the pressure on her to perform as perfectly as possible in all roles. This refers to her roles as a passionate wife, loving mother, etc. In view of these numerous demands, the protagonist can only fail. What is astonishing, however, is that her male former colleague, who works just as much as she does, is not abandoned by his wife and perceived as a winner.

7 Discussion and Conclusions

The assumption that cultural artefacts, through their omnipresence in the material world, shape the attitudes and social representations of people in a society, including those of young people, is the starting point for this study. At the same time, cultural artefacts can be understood as reconstructions of reality that provide information about the patterns of perception of their producers. For this reason, one criterion for analysing the artefacts is that they were produced by people closely connected to the cultural context of Mexico. Interestingly, most of the analysed artefacts featuring forms of representation and narratives about non-academic work were created almost exclusively by persons of male gender. For this reason, a predominantly male-framed perspective on the object of non-academic work opened up, which on the one hand can be read as a weakness of the artefact analysis conducted. On the

[17] Violator.
[18] Violated.

other hand, the low female presence in relation to the subject matter also reflects, in a certain way, the low participation of women in the formal labour market in Mexico. For example, according to OECD (2019), Mexican women are significantly less involved in formal employment than men. Moreover, females are significantly more likely to be neither enrolled in the education system nor in employment or training (NEET). Overall, the aspect of machismo prevalent in Mexico has not gone unnoticed in the forms of representation and narratives on non-academic work, as numerous artefacts contain and reproduce gender stereotypes.

As already described, it is assumed in this context that narratives and forms of representation in relation to non-academic work can give an indication of the cultural imprints and normality assumptions towards the object of study. Based on the findings presented here, it is possible to make some preliminary hypotheses about the social representations prevalent in Mexican society that affect the young population. For example, young people might perceive non-academic work as relatively unattractive because it is often informal, implying a lack of security, poor wages, etc. Furthermore, the representations and narratives show that, apart from office work, non-academic work is physically demanding but cognitively unchallenging. In terms of access to a company and promotion, social networks seem to have enormous relevance - the so-called *compadrazgo*-System (Pries, 2010) is often visible. Hierarchies seem rigid and opportunities for promotion limited. However, a narrative with more positive attributions regarding non-academic work can also be identified, which state that young people experience a habitus transformation through work. Nevertheless, non-academic work in Mexico seems to lack prestige, which could also have an impact on young people's educational and career aspirations and choices. This could mean that those who can afford it prefer to pursue a career in tertiary education rather than opt for a TVET programme. At the macro level, for example, the aforementioned lack of reputation could hamper attempts to implement such programmes, even though the training programmes are seen as offering great potential at many levels (OECD, 2019).

With the help of artefact analysis, interesting insights into culturally anchored social representations can be gained, whereby the forms of representation of non-academic work become visible in different depths. Regarding the method, it can be said that artefact analysis seems to be a good way to approach a new field of work or an unknown cultural context. However, the representations and narratives refer to the perspective of those social actors who are in certain positions of power and can therefore make themselves heard in the chorus of cultural artefacts. In summary, artefact analysis offers an interesting approach to a research object, but like any method, it has limitations, which can, however, be partially overcome in combination with other methods such as biographical interviews.

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References

Abric, J. C. (1993). Central system, peripheral system: Their functions and roles in the dynamics of social representations. *Papers on Social Representations*, *2*(2), 75–78. https://psr.iscte-iul.pt/index.php/PSR/article/view/126

Almeida, R., Anazawa, L., Menezes F., & Vasconcellos, L. (2015). Investing in technical and vocational education and training: Does it yield large economic returns in Brazil? *Policy Research Working Paper*, 7246. World Bank. https://openknowledge.worldbank.org/handle/10986/21861

Araya Umaña, S. (2002). Las representaciones sociales: Ejes teóricos para su discusión [Social representations: Theoretical axes for discussion]. *Cuaderno de Ciencias Sociales*, 127. FLACSO.

Arnold, R. (1989). Berufsbildung in Lateinamerika [Vocational training in Latin America]. *International Review of Education, 35*(2), 159–177. https://www.jstor.org/stable/pdf/3444425.pdf?refreqid=excelsior%3Ae9e8f4df6b145f371f8c12b3c987735f

Assmann, J. (1988). Kollektives Gedächtnis und kulturelle Identität [Collective memory and cultural identity]. In J. Assmann & T. Hölscher (Eds.), *Kultur und Gedächtnis* (pp. 9–19). Suhrkamp. https://archiv.ub.uni-heidelberg.de/propylaeumdok/1895/1/Assmann_Kollektives_Gedaechtnis_1988.pdf

Bayón, M. C. (2008). Konturen des informellen Sektors in Mexiko und Argentinien [Contours of the informal sector in Mexico and Argentina]. In D. Boris, T. Gerstenlauer, A. Jenss, K. Schank & J. Schulten (Eds.), *Sozialstrukturen in Lateinamerika. Ein Überblick* (pp. 147–170). VS.

Becker, R. (2004). Wandel der Sozialstruktur von Erwerbsverläufen [Change in the social structure of employment histories]. In F. Behringer (Ed.), *Diskontinuierliche Erwerbsbiographien. Zur gesellschaftlichen Konstruktion und Bearbeitung eines normalen Phänomens* (pp. 59–70). Schneider.

Behringer, F. (2004). *Diskontinuierliche Erwerbsbiographien. Zur gesellschaftlichen Konstruktion und Bearbeitung eines normalen Phänomens* [Discontinuous employment biographies. On the social construction and processing of a normal phenomenon]. Schneider.

Bourdieu, P. (1993). *Sociology in Question*. Sage.

Brose, H., & Wohlrab-Sahr, M. (2018). Arbeit und Biografie [Work and biography]. In H. Lutz, M. Schiebel & E. Tuider (Eds.), *Handbuch Biografieforschung*. (pp. 485–497). Springer.

Cáceres-Reebs, D., & Schneider, U. (2013). Berufsausbildung in Mexiko. Wie das Land das duale Modell tropenfest macht [Vocational education and training in Mexico – How the country has tropicalised the dual model]. *Berufsbildung in Wissenschaft und Praxis (BWP), 5*, 11–16. https://www.bwp-zeitschrift.de/de/bwp.php/de/bwp/show/7133

Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and changing organizational culture. Based on the competing values framework*. Jossey-Bass.

Cillo, V., Garcia-Perez, A., Del Giudice, M., & Vicentini, F. (2019). Blue-collar workers, career success and innovation in manufacturing. *Career Development International, 24*(6), 529–544. https://doi.org/10.1108/CDI-11-2018-0276

Clement, U. (1999a). *Politische Steuerung beruflicher Bildung. Die Bedeutung unterschiedlicher Entwicklungslogiken für die Berufsbildungspolitik in Ländern der Dritten Welt am Beispiel Chile* [Political governance of vocational education and training. The significance of different development logics for VET policy in Third World countries, taking Chile as an example]. Nomos.

Clement, U. (1999b). Die transnationale Kommunizierbarkeit des Berufs: Verständigungsprobleme im globalen Dorf [The transnational ability to communicate the concept of Beruf: Communication problems in the global village]. *Zeitschrift Für Pädagogik, Beiheft 40*, 209–231.

Clement, U. (2016). Nationale Qualifikationsrahmen zwischen Aufbruch und Institution [National qualification frameworks between departure and institution]. In H. Altrichter (Ed.), *Handbuch Neue Steuerung im Schulsystem* (pp.439–454). Springer.

Clement, U., & Oelsner, V. (2016). *Was macht Schule? Schule als gestalteter Raum* [What does school do? School as a designed space]. Springer.

Curchod, C., Patriotta, G., Cohen, L., & Neysen, N. (2019). Working for an algorithm: Power asymmetries and agency in online work settings. *Administrative Science Quarterly*. https://doi.org/10.1177/0001839219867024

Deißinger, T., & Frommberger, D. (2010). Berufsbildung im internationalen Vergleich. Typen nationaler Berufsbildungssysteme [Vocational education and training in international comparison. Types of national vocational training systems]. In R. Nickolaus, G. Pätzold, H. Reinisch & T. Tramm (Eds.), *Handbuch Berufs- und Wirtschaftspädagogik* (pp. 343–348). Klinkhardt. https://d-nb.info/1113109610/34

Elsbach, K. D. (2003). Relating physical environment to self-categorizations: Identity threat and affirmation in a non-territorial office space. *Administrative Science Quarterly*, 48, 622–654.

Erll, A. (2017). *Kollektives Gedächtnis und Erinnerungskulturen: Eine Einführung* [Collective memory and memory cultures: An introduction] (3rd ed., revised). J.B. Metzler. https://doi.org/10.1007/978-3-476-05495-1

Geertz, C. (1973). T*he Interpretation of cultures*. Basic Books.

Georg, W. (1997). Kulturelle Tradition und berufliche Bildung. Zur Problematik des internationalen Vergleichs [Cultural tradition and vocational training. The problem of international comparison]. In W.-D. Greinert, W. Heitmann, R. Stockmann & B. Vest (Eds.), *Vierzig Jahre Berufsbildungszusammenarbeit mit Ländern der Dritten Welt. Die Förderung der beruflichen Bildung in den Entwicklungsländern am Wendepunkt?* (pp.65–94). Nomos.

Giesecke, J., & Wotschack, P. (2009). Flexibilisierung in Zeiten der Krise. Verlierer sind junge und gering qualifizierte Beschäftigte [Flexibility in times of crisis. Young and low-skilled workers are the losers]. *WZBrief*. https://bibliothek.wzb.eu/wzbrief-arbeit/WZBriefArbeit012009_giesecke_wotschack.pdf

Greinert, W.-D. (1997). Das Strategieproblem in der Berufsbildungszusammenarbeit und die Rolle von Wissenschaft und wissenschaftlicher Theorie [The strategy problem in vocational training cooperation and the role of science and scientific theory]. In W.-D. Greinert, W. Heitmann, R. Stockmann & B. Vest (Eds.), *Vierzig Jahre Berufsbildungszusammenarbeit mit Ländern der Dritten Welt. Die Förderung der beruflichen Bildung in den Entwicklungsländern am Wendepunkt?* (pp. 53–64). Nomos.

Hall, C. C., Zhao, J., & Shafir, E. (2014). Self-affirmation among the poor: Cognitive and behavioral implications. *Psychological Science, 25*(2), 619–625.

Held, J., & Schneider, N. (2007). *Grundzüge der Kunstwissenschaft: Gegenstandsbereiche - Institutionen – Problemfelder* [Fundamentals of art studies: subject areas - institutions - problem areas]. UTB.

IAB México, Kantar Millward Brown, & Televisa Digital. (2017). *Generación Z: Estudio de consumo de medios entre internautas Mexicanos 2017* [Generation Z: Media consumption study among Mexican Internet users 2017]. https://www.iabmexico.com/estudios/consumo-medios-2017-generacion-z/

Icardi, R. (2021). Returns to workplace training for male and female employees and implications for the gender wage gap: A quantile regression analysis. *International Journal for Research in Vocational Education and Training, 8*(1), 21–45. https://journals.sub.uni-hamburg.de/hup2/ijrvet/article/view/506/293

INEGI (2020). *Encuesta nacional de dinámica demográfica*. INEGI Publishing. https://www.inegi.org.mx/programas/enadid/

Kahn, W. A. (2001). Holding environments at work. *Journal of Applied Behavioral Science, 37*(3), 260-279. https://journals.sagepub.com/doi/pdf/10.1177/0021886301373001

Kleemann, F., Krähnke, U., & Matuschek, I. (2009). *Interpretative Sozialforschung: Eine praxisorientierte Einführung* [Interpretative social research: A practice-oriented introduction]. VS. https://doi.org/10.1007/978-3-531-91987-4

Kroeber, A. L., & Kluckhohn, C. (1952). Culture: A critical review of concepts and definitions. P*apers. Peabody Museum of Archaeology & Ethnology, Harvard University, 47*(1), viii, 223.

Kutscha, G. (2008). Beruflichkeit als regulatives Prinzip flexibler Kompetenzentwicklung - Thesen aus berufsbildungstheoretischer Sicht [Professionalism as a regulatory principle of flexible competence development - theses from a VET theory perspective]. *Berufs- Und Wirtschaftspädagogik - Online, 14*, 1–11. http://www.bwpat.de/ausgabe14/kutscha_bwpat14.shtml

Lauterbach, U. (1994). Schulische und betriebliche Berufsbildung im internationalen Vergleich [School and company-based VET in international comparison]. *Bildung und Erziehung, 47*(3), 237–248. https://doi.org/10.7788/bue.1994.47.3.237

Lehner, R. (1994). *Struktur- und Gestaltungsprobleme der beruflichen Bildung in Lateinamerika. Dargestellt am Beispiel Ecuador* [Structural and design problems of vocational training in Latin America. Presented by the example of Ecuador]. Lang.

Lueger, M. (2010). *Interpretative Sozialforschung: Die Methoden* [Interpretative social research: The methods]. UTB.

Lueger, M., & Froschauer, U. (2018). *Artefaktanalyse: Grundlagen und Verfahren. Lehrbuch* [Artefact analysis: Principles and procedures. Textbook]. Springer VS.

Matthes, B., & Vicari B. (2018). Arbeitsmarktorientierte Berufsforschung [Labour market-oriented occupational research]. In R. Arnold, A. Lipsmeier & M. Rohs (Eds.), *Living reference work. Handbuch Berufsbildung* (pp. 1–12). VS Springer. https://doi.org/10.1007/978-3-658-19372-0 52-1

Mendoza, S., Raesfeld, L., & López, S. (2020). Nuevos procesos de identidad en poblaciones indígenas: el caso del Catálogo de Pueblos y Comunidades Indígenas del estado de Hidalgo [New identity processes in indigenous populations. The case of the catalog of Indigenous communities of the State of Hidalgo]. In M. G. Galicia, K. H. Pizarro & U. M. Romero (Eds.), *Identidades en contexto, teorías, métodos y análisis de casos* (pp. 191–220). UNAM.

Moscovici, S. (1988). Notes towards a description of social representations. *European Journal of Social Psychology, 18*, 211–250. https://doi.org/10.1002/ejsp.2420180303

Moscovici, S., & Duveen, G. (2001). *Social representations: Explorations in social psychology*. New York University Press.

Organisation for Economic Co-operation and Development OECD. (2019). *OECD Economic surveys: MEXICO 2019*. OECD Publishing. https://doi.org/10.1787/a536d00e-en

Oelsner, V., & Richter, C. (2015). *Bildung in Lateinamerika. Strukturen, Entwicklungen, Herausforderungen* [Education in Latin America. Structures, developments, challenges]. Waxmann.

Pries, L. (2010). *Erwerbsregulierung in einer globalisierten Welt. Theoretische Konzepte und empirische Tendenzen der Regulierung von Arbeit und Beschäftigung in der Transnationalisierung* [Employment regulation in a globalised world. Theoretical concepts and empirical tendencies of the regulation of work and employment in transnationalisation]. Springer VS.

Ramos y Duarte, F. (1898). *Diccionario de mejicanismos* [Dictionary of xexicanisms]. Herrero Hermanos.

Real Academia Española. (2020). *Diccionario de la lengua Española* [Spanish language dictionary]. https://www.rae.es/drae2001/patr%C3%B3n

Sagiv, L., & Schwartz, S. (2007). Cultural values in organizations. Insights for Europe. *European Journal of International Management, 1*(3), 176–190. https://doi.org/10.1504/EJIM.2007.014692

Santhanam, N., & Srinivas, S. (2019). Modeling the impact of employee engagement and happiness on burnout and turnover intention among blue-collar workers at a manufacturing company. *Benchmarking, 27*(2), 499–516. https://doi.org/10.1108/BIJ-01-2019-0007

Schönstedt-Maschke, A. (2013). Armutsbekämpfung durch berufliche Bildung. Fallbeispiel SENATI/Peru [Poverty reduction through vocational training. Case study SENATI/Peru]. In R. Öhlschläger & H. Sangmeister (Eds.), *Von der Entwicklungshilfe zur internationalen Zusammenarbeit* (pp.113–126). Nomos.

Schützeichel, R. (2007). Soziale Repräsentationen [Social representations]. In R. Schützeichel (Ed.), *Handbuch Wissenssoziologie und Wissensforschung* (pp. 450–455). UVK.

Sevilla, M. P. (2017). Panorama de la educación técnica profesional en América Latina y el Caribe [Overview of vocational technical education in Latin America and the Caribbean.]. *Serie Políticas Sociales*.

Tylor, E. B. (1891). *Primitive culture. Researches into the development of mythology, philosophy, religion, language, art and custom*. Oxford.

Voß, G. (1998). Die Entgrenzung von Arbeit und Arbeitskraft. Eine subjektorientierte Interpretation des Wandels der Arbeit [The demarcation of work and labour. A subject-oriented interpretation of the change of work]. *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung, 31*(3), S. 473–487. http://doku.iab.de/mittab/1998/1998_3_MittAB_Voss.pdf

Wallenborn, M. (2001). Die berufliche Bildung in Lateinamerika [Vocational education and training in Latin America]. *Europäische Zeitschrift Berufsbildung, 22*, 62–73. https://www.cedefop.europa.eu/files/22-DE.pdf

Wiemann, K. (2018). *Mexiko* [Mexico]. Budrich.

Wolf, S. (2011). Arbeitskultur und der Transfer von Berufsbildungselementen in andere Länder [Work culture and the transfer of vocational training elements to other countries]. *Zeitschrift für Berufs- und Wirtschaftspädagogik, 107*(4), S. 543–567.

Wolf, S., Penton, F., Beltran Marin, A., & Romero, O. (2011). The Cuban Vocational Education and Training System and its Current Changes. *Journal for Critical Education Policy Studies, 9*(1), S. 224–240. http://www.jceps.com/wp-content/uploads/PDFs/09-1-09.pdf

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Mapping Research on European VET Policy With a Systematic Literature Review Method: A Pilot Study

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Abstract

Purpose: A systematic literature review has neglected for years in both national and international vocational educational and training (VET) policy research. Recently, scholarly interest in and the need for such a review has increased rapidly. This review introduces the application of the systematic literature review method, with a focus on research work completed in European VET policy.

Approach: To investigate the value and applicability of the systematic literature review method in European VET policy research, we conducted a pilot study following the guidelines and procedures presented by Gessler and Siemer.

Findings: First, the process of conducting a literature review and its major methodological steps are described, followed by a descriptive analysis of the sample and characteristics of the studies reviewed. Second, initial insights into the research methodology and the topics that emerged during its application are presented. Altogether, we documented a first attempt to systematize research on European VET policy, including lessons learned from conducting a systematic literature review.

Conclusion: The review revealed that although research on international European VET policy research has increased in recent years, hardly any systematization of the current

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research has been proposed. Instead, most research has been limited to identifying specific country-related factors. By comparison, we propose a systematic approach to reviewing research on European VET policy, being well aware of the strengths and limitations of the proposed method and the results. Thus, this systematic review presents a substantial starting point and research agenda for further studies on this topic.

Keywords: Systematic Literature Review, Education Policy, Europe, VET, Pilot Study, Vocational Education and Training

1 Introduction

In recent decades, VET policy and governance have attracted growing interest in international and comparative studies, such as country case studies or cross-national comparisons. Some studies have addressed the internationalization of VET (Smith & Smith, 1999; Tran, 2013), whereas others have examined the international transfer of VET (Euler, 2013; Mewaldt, 2014). Further, some studies have focused on VET in Europe in general (e.g., with country reports provided by the Cedefop), with many of these addressing VET policy in relation to the Lisbon strategy (Ante, 2016; Walkenhorst, 2005). Some review articles have emerged in the past years, indicating a highly complex and fragmented field (Busemeyer & Trampusch, 2011; Li & Pilz, 2021). Although these studies have provided a partial overview of the field, it remains somewhat vague how such literature reviews were conducted methodologically. Thus, despite mounting research on education policy (Bohlinger et al., 2016; Busemeyer & Trampusch, 2011) and attempts to systematize methodological and theoretical approaches to investigating governance and policy transfer in VET (Barabasch, 2010; Li & Pilz, 2021), few studies have examined the current state of research in the field by conducting systematic literature reviews (see for example, Caves et al., 2019).

Against a backdrop of the vast volume of literature, the aim of our pilot study was to apply a systematic literature review method in the field of international (in detail: European) VET research. We explored whether and subsequently how the method could be used to map the current state of research. To investigate the value and applicability of the systematic literature review in examining such research, we performed the methodological steps proposed by Gessler and Siemer (2020). In particular, we were concerned with reporting the process of applying a systematic literature review to research addressing European VET policy and assessing its practicability. To that end, we focused on the methods used and their applicability, not on expanding the discourse on VET policy in Europe. The remainder of this paper proceeds as follows: First, we present the methods used in this study. Second, we report our pilot findings and explain the limitations of our review. Finally, we articulate the implications for future research.

2 Methodology

The pilot study was undertaken as a systematic literature review using the methodology proposed by Gessler and Siemer (2020). Inspired by systematic reviews in other fields (e.g., medicine), this approach allows other researchers to replicate and update the literature by providing a transparent account of the reviewers' procedures (Booth, 2016; Hart, 2018; Moher et al., 2009). In accordance with Gessler and Siemer (2020, p. 104; see Table 4), the procedure of a literature review consists of the following four steps (Figure 1):

1. Defining the scope (i.e., specifying the research problem and research question).

2. Selecting data (systematic search and eligibility screening: Defining the sources and search terms, including the relevant research, and screening and reading the selected research to exclude ineligible research).

3. Processing the data, involving critical appraisal (i.e., assessing the quality of the selected sources to exclude poor or inappropriate ones), analysis (i.e., selecting the relevant data from the different texts and critically evaluating the data extracted), and synthesis (i.e., synthesizing and reanalyzing the pooled data).

4. Reporting the data (presenting the findings and discussing the conclusions and limitations of the review).

We used four steps of the review process to create a review protocol to conduct the pilot study. In the following steps, we provide insights into our pilot results by reflecting on the application and suitability of the literature review method in our specific topic area.

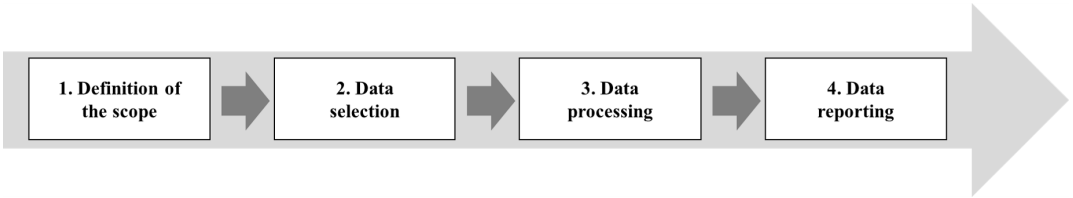


Figure 1: Steps of a Systematic Literature Review (adapted from Gessler and Siemer, 2020)

2.1 Step 1: Defining the Scope

The pilot study focused on the European VET policy and aimed to identify relevant literature following a clear, sound methodological approach proposed by Gessler and Siemer (2020). Our aim was not to detail research on European VET policy in terms of comparative education. However, this study provides an additional step in mapping the landscape and scope of research on European VET policy research, while applying and testing the methodology in a heterogeneous field. In particular, we sought to answer the following research questions:

1. What literature can be identified by applying a systematic literature review method of research on European VET policy?
2. What are the main characteristics of the identified studies?
3. Which research methodologies were followed in the selected studies?
4. Which research topics can be identified from the studies?
5. What are the strengths and limitations of the systematic literature review method applied to research on European VET policies?

2.2 Step 2: Selecting the Data

The literature search for the review, conducted from August to November 2020, involved searching databases for relevant studies in peer-reviewed literature. We selected the following databases: Academic Source Complete (EBSCO), Web of Science (WoS), VOCEDplus, ERIC, and Scopus (all databases frequently used by researchers across various disciplines and mentioned by Gessler & Siemer, 2020). To search titles, abstracts, and keywords, we developed a search query by breaking the main topic down into search terms. We searched for "VET" or "vocational education and training"[1] in combination with "polic*" (and other appropriate terms, e.g., "governance" or "system*", and "reform*"). We limited our search to English peer-reviewed academic articles published from 2000 to 2020, being aware that there might be numerous non-English articles.[2] We also restricted the document type to "journal articles" and used only sources that were available in full text. In doing so, we attempted only a pilot

1 In Europe, the common term for skills development in institutionalized pathways refers to "vocational education and training" (VET). We are well aware that terms such as "industrial training", "work-based-learning", and "apprenticeship" are common in other contexts. However, as our focus is on policy and governance in vocational contexts in Europe, our main search focused on the terms "vocational education and training" either in combination or as single terms.

2 Our first attempt at the systematic literature review aimed at identifying meta-studies (meta-analyses), which presumably would have been in English only. However, because we could not identify any meta-studies addressing European VET policy or VET policy per se, we expanded our scope towards non-meta-studies but kept English as the sole language of publication.

search of the literature (i.e., limited to most representative articles in peer-reviewed journals), not a comprehensive literature selection.

Figure 2 represents the stages of selecting sources from the literature. First, the titles, abstracts, and keywords of the journal articles were scanned for any connection to our chief topic. All articles related to other fields (e.g., veterinarian research) were excluded. Of the remaining 75 articles, five duplicate articles (i.e., the same article indexed in different databases) were eliminated. After this initial check, we assessed the remaining articles in two stages. The first stage involved evaluating the abstracts based on predefined criteria. One author marked the articles of exclusion based on the criteria, which were double-checked by another author. Accordingly, 28 of the 70 articles were excluded. The second stage comprised evaluating the relevance of the full-text articles. Ultimately, 30 articles remained for further investigation.

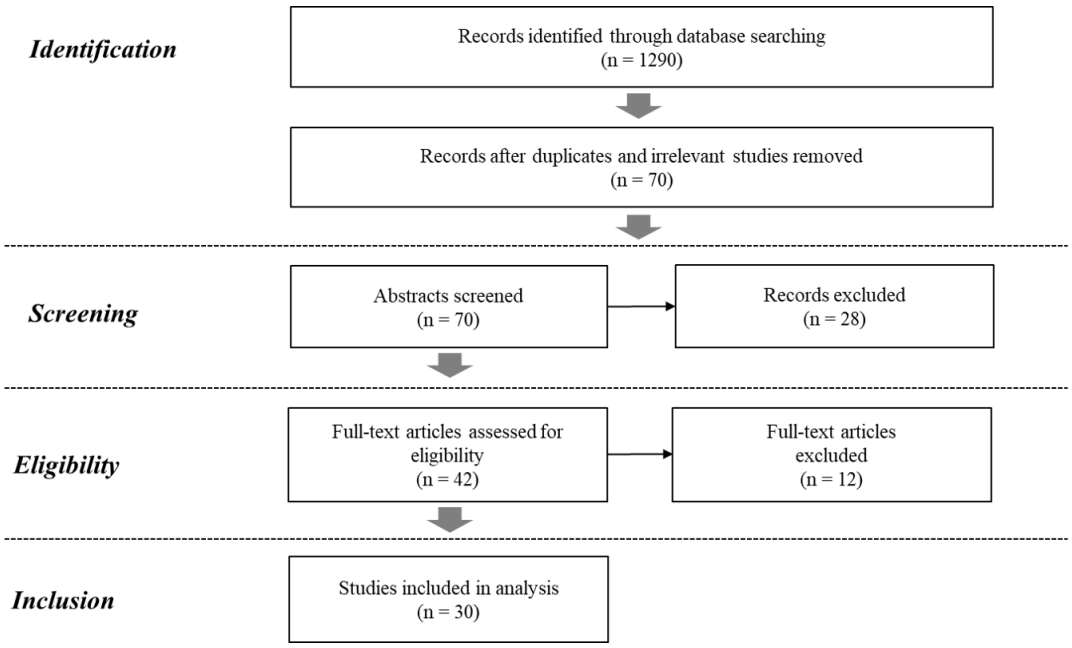


Figure 2: Flow Diagram of Article Selection

To be included in the review (i.e., pilot study), the articles had to fulfill four criteria:

1. Focus on research addressing the VET policy. Because we aimed at a comprehensive understanding of the topic, we did not exclude any research context and consciously included all kinds of articles, regardless of their disciplinary perspective.

2. Provide insights into the European context at national, international, and/or systemic levels.

3. Include a clear description of the theoretical approach taken, or the methodology in the case of empirical studies.

4. Be published in English in (double-blind) peer-reviewed journal articles from 2000 (i.e., commencing with the Lisbon Strategy) to 2020.

2.3 Step 3: Processing the Data

The third step included critical appraisal, extracting relevant data, data analysis, and synthesis. After identifying our main sources, selected articles were evaluated based on predefined criteria[3] by two authors separately. Their individual results were discussed and agreed upon. Subsequently, a data extraction form was developed to process the data. To characterize the literature examined in our pilot review, chief characteristics were extracted from each study (i.e., authors, source, date of publication, and first author's country of residence), the study was summarized and research questions were noted. To analyze the articles, we first structured and classified them based on evident data (e.g., date of publication or journal background) and assessed their overall relevance in Microsoft Excel. Based on our research questions, we developed an overview of the themes emerging from the articles. For this purpose, we analyzed the content based on their similarities and differences (Aveyard, 2010) on a broader level and grouped similar themes into main categories. After that, we developed a brief summary of the aim, approach, and major findings of each article and wrote a short statement on the findings. Finally, we undertook a critical discussion and systematization of the emerging themes.

2.4 Step 4: Reporting the Data

In the final step, a descriptive analysis of the sample and the characteristics of the articles were reported. To characterize the literature included in our review, we used six categories: (1) Date of publication, (2) first author's country of residence, (3) journals and subject area, (4) type of articles and research methods, and (5) emerging topics and systematization of content. Given that our study was a pilot study, we focused on the application of the method and the reporting of the data, rather than the interpretation of data.

3 Critical appraisal tools are available for many kinds of research studies (see Gessler & Siemer, 2020). For the purpose of our pilot study, we only focused on our predefined selection criteria.

3 Results

3.1 Date of Publication

Articles published between 2004 and 2020 are depicted in Figure 3. The majority of them were published after 2010, with the highest number of sources found in 2010 (four articles), 2015 (four articles), and reached a peak in 2018 (five articles). The trend line and constant presence of publications in the last five years indicated that the publication of articles is increasing. This emphasized the issue and the nature of the debate about adapting to changing environments, implying growing interest in scientific research and publishing in peer-reviewed journals. This supported the findings of the European VET policy becoming the focus of researchers, particularly after 2000, perhaps being influenced by developments in EU policy (Lisbon Strategy, Europe 2020). As earlier research on European VET policy focused primarily on these developments from a broader perspective over the years, the focus shifted towards the question of how VET is governed at supranational and national levels.

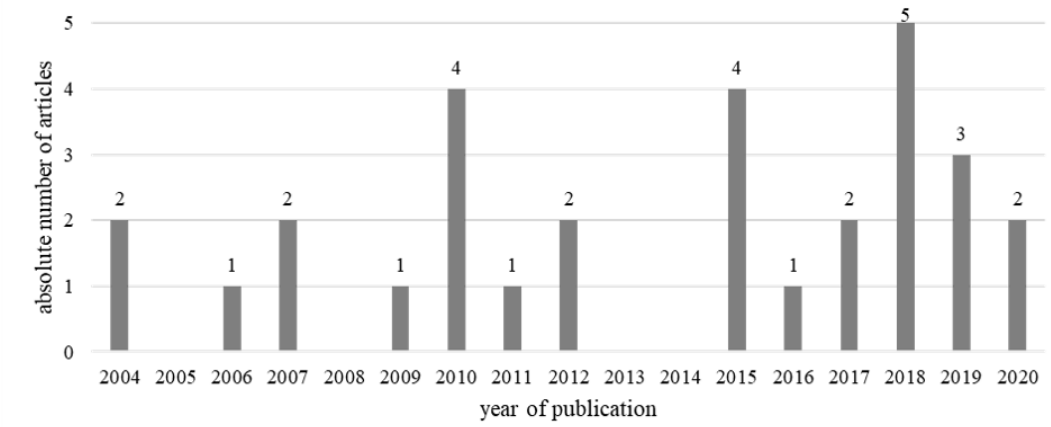


Figure 3: Number of Articles by Year of Publication

3.2 Country of Residence of First Author

In this classification, we examined the background of each first author to provide more insights into their country of residence. As can be observed in Figure 4, nine articles originated in Germany, followed by four articles produced in the UK. Studies were located from Estonia, Switzerland, Italy, and Norway. Numerous contributions from Germany can be explained by both the relatively high number of researchers in the field emanating from Germany's

high number of inhabitants and an extensive national research interest in VET. Since we only focused on articles published exclusively in English, the data also illustrated countries current general interest to publish in English. However, this classification did not provide an explicable finding, since the origin of a study can be attributed to the increasing international cooperation of universities and research institutions. Most of the studies were written by a single author, with few studies produced in cooperation with other scholars.

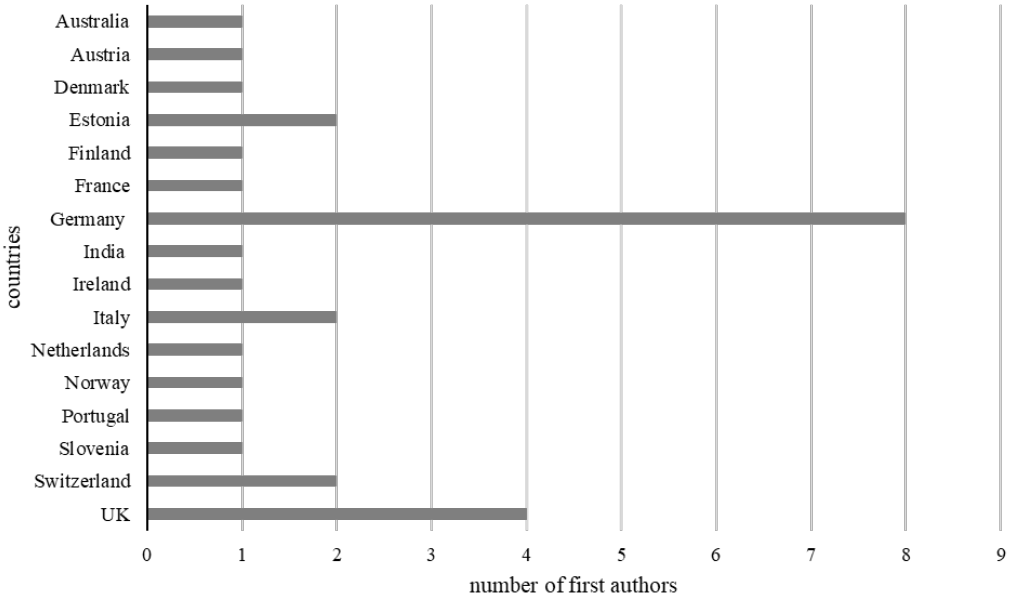


Figure 4: Country of Residence of First Author

3.3 Journals and Subject Areas

By limiting the articles to only double-blind peer-reviewed journals, we were able to determine the most important current journals in this area. The publications were classified by being divided into two groups: Educational and policy-related journals. Twenty-seven sources were published in leading educational journals with a clear focus on VET. However, as exhibited in Table 1, three articles were published in policy-related journals. The journals *Research in Comparative and International Education (RCIE), International Journal for Vocational Education and Training (IJRVET), and Journal of Vocational Education and Training (JVET)* were well represented with between four and six articles. *European Journal of Vocational Training (EJVT), European Journal of Education (EJE), and Journal of Education and Work (JEW)*, with a European focus were also well represented with two to three articles. The remaining

journals were represented by only one article each. The high distribution in different journals can be explained by the fact that VET is a highly heterogeneous field and has been researched by various disciplines with theoretical and empirical approaches.

Table 1: Journals and Subject Areas

Journal (educational focus, VET)	**Abbreviation**	**#**
Research in Comparative and International Education	RCIE	6
International Journal for Vocational Education and Training	IJVETR	5
Journal of Vocational Education and Training	JVET	4
European Journal of Vocational Training	EJVT	3
European Journal of Education	EJE	2
Journal of Education and Work	JEW	2
Journal of Adult and Continuing Education	JACE	1
Empirical Research in Vocational Education and Training	ERVET	1
International Journal of Lifelong Education	IJLE	1
Journal of Comparative and International Education	Compare	1
Oxford Review of Education	Oxf. Rev. Educ.	1
N (total)		**27**
Journal (policy-related focus, others)	**Abbreviation**	**#**
Governance: An International Journal of Policy and Administration	Governance	1
European Journal of Industrial Relations	Eur. J. Ind. Relat.	1
Transfer: The European Review of Labour and Research	Transfer	1
N (total)		**3**

3.4 Types of Articles and Research Methods

Another classification of articles was provided based on the type of article and the research methodology used. The articles were first categorized into applied research articles and theoretical articles to examine whether the articles were either conceptual or empirical in nature. For some articles, the author did not state which method was applied. These characteristics were assessed after reading the articles. Articles were classified as theoretical papers if there was a limited or absent empirical component. If a clearly elaborated methodological and empirical component existed, the article was classified as empirical research. Overall, the majority of articles were empirical in nature, with less research providing only a theoretical (conceptual) analysis.

A close examination of the methodology of the articles revealed that the majority were qualitative or explorative in nature, with a mix of qualitative and quantitative methods. Almost half of the articles involved single-or multiple-case studies. The preferred methods for collecting data were interviews and questionnaires. Other forms included the analysis of

political documents and other historical or national data. Common data analysis methods involved content analysis or country-based analysis. This wide range of research approaches and methods emphasizes the growing interest of researchers from different backgrounds and perspectives.

3.5 Emerging Topics and Systematizing the Content

Following the planned steps, the articles were classified by assessing the similarities of topics and methods used. In the first preliminary analysis, we identified three main categories (or primary topics): EU policy and EU governance, comparison of countries, and impact of policy on Member States—and three methodological instruments—content analysis, comparative analysis of countries, and single-country studies (Figure 5). Although they overlap in scope and content, they provided initial insights into the content and state of research on the topic. Due to wide ranging topics that emerged in the pilot study, we briefly summarized the articles in each category.

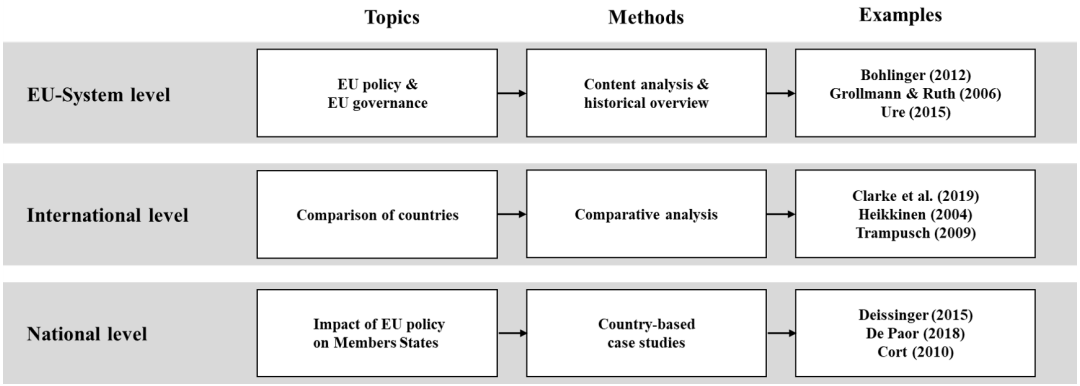


Figure 5: Emerging Topics and Systematization of Content

(1) Governance in European VET Policy at the EU System Level

Regarding content, 12 articles were assigned to the first category. The topic of EU policy or governance in VET was examined at the European meta or macro level. At this level, the specifications and implementation of VET policies in Europe were analyzed. Contextually, the question of the success of established governance structures and processes was relevant, being measured by the outcomes and structures of VET systems and their functionality (Barabasch, 2010). We found diverse article topics such as implementation of qualifications frameworks, VET policies and governance structures, comparisons of training models, and

more. The methodological approach of these articles employed content analysis, historical overviews, and qualitative analysis of relevant documents.

Specifically, Bohlinger (2012) and Ure (2015) analyzed countries' experiences with learning outcomes and its efforts to establish or reform qualifications frameworks according to the European Qualifications Framework (EQF). We revealed the emergence of a learning outcomes orientation from an EU policy perspective and reviewed countries' anticipations and expectations regarding the development of qualifications frameworks and instruments to validate learning outcomes. The focus of both papers is on governing VET policy, for example, by means of the Open Method of Coordination (OMC). Similarly, Grollmann and Ruth (2006) address the Lisbon Agenda and its implications for VET. Their article covers the relevant EU policy topics, including the Bruges-Copenhagen Process, the ECVET (European Credit System for Vocational Education and Training), the EQF, and the OMC as a means to attain the Lisbon Goals. The authors showed that there was "no standard European path for achieving the Lisbon Goals, but rather that there are considerable variations depending on the prevailing VET systems and the respective VET policy" (Grollmann & Ruth, 2006, p. 366). From the aforementioned EU policy topics, the ECVET is dealt with in greater depth in another paper. Ryan et al. (2018) focused on the equivalency and compatibility between the ECVET and the ECTS (European Credit Transfer System) by reviewing the findings of 11 EU-funded projects. The authors concluded that the projects were successful in identifying several points of compatibility and developing useful tools and frameworks to facilitate permeability between the two systems. While achieving credit equivalency between the ECVET and the ECTS does not seem feasible, the findings indicated that using a learning outcome-based equivalency framework seems a more promising approach.

Greinert (2004) and Clarke and Winch (2015) analyzed "design philosophies" (Clarke & Winch, 2015, p. 543) of VET policies and VET structures. The authors identified and compared national VET structures and training models (mostly the German apprenticeship scheme and the Anglo-Saxon training model) against other countries' VET structures in light of their historical emergence. Contrary to the EU's dominating VET policy aims, they conclude that "the effectiveness of the European tools and their successful implementation at occupational and sectoral levels […] will rest on incorporating employee interests and greater educational content into VET systems" (Clarke & Winch, 2015, p. 604). Similarly, but with a stronger focus on decision-making processes, Oliver (2010) applies a framework of governance (Pierre & Peter, 2005) "to assess the impact of complexity in VET governance systems by focusing on how complexity affects the four governance system outcomes: Adaptability, coherence, inclusiveness, and accountability" of VET systems in England, Australia, the United States, Germany, Spain, and Denmark (Oliver, 2010, p. 270). While Greinert (2004) and Clarke and Winch (2015) contrast mostly different training models, Emmenegger et al. (2019) compare similar training models—so-called collective skill formation systems in

Austria, Denmark, Germany, the Netherlands, and Switzerland. Their conceptual article focuses on corporative and decentralized governance structures where the authors develop a "framework for the analysis of cooperation in decentralised collective skill formation systems" (Emmenegger et al., 2019, p. 23) that is "helpful for the analysis of those areas of political economies in which actors face cooperation dilemmas within decentralised governance contexts" (p. 39). Cooperation as a condition of success is also emphasized in an article by Šćepanović and Artiles (2020). The concept of dual VET is discussed by explaining the competing logics behind it and providing an overview of the EU's policy approaches to VET. They claim that VET represents a special kind of formation, which requires high levels of coordination among all stakeholders to ensure quality and comparability. However, many European countries lack necessary institutional prerequisites. Consequently, "despite the investment of significant resources into the promotion of 'dual' VET, the results so far have been, and are likely to remain, highly uneven" (Šćepanović & Artiles, 2020, p. 24).

Rauner and Wittig (2010) also compared corporativist VET systems and structures in Austria, Denmark, Germany, and Switzerland. Similar to Greinert, they focus on the incorporation of work process knowledge in VET structures and its implications for governing VET structures. Their overview of a theoretical framework to identify plural governance structures in VET (in particular in apprenticeship schemes) concludes that "complexity associated with different governance processes and the ways they have evolved demonstrates a need to distinguish between complexity relating to decision-making processes and policy instruments and processes for allocating resources and generating feedback" (Rauner & Wittig, 2010, p. 271).

Viertel (2010) explored international VET cooperation and made the case for considering sustainable development to be a policy obligation for the European Training Foundation (ETF) and VET reform efforts in its partner countries as "adjusting VET to today's complex sustainability challenges is a major, but essential task" (Viertel, 2010, p. 231). Based on a discussion of economic practices from a sustainability perspective, the author investigated what impact on knowledge and skills could be derived from this. Implications for VET reforms, especially those supported by the ETF, include the application of inclusive practices, the reconsideration of competences for sustainable development, and the design of appropriate didactical approaches to foster them.

The article by Kämäräinen (2017) is somewhat different from the other articles in that it is a tribute to David Raffe's lifetime achievement on VET research, VET policy, and European cooperation.

(2) European VET Policy and Cross-Country Comparisons in the EU

The second category examines the European VET policy and comprises cross-country comparisons. Ten articles were identified in this category, which were heterogeneous regarding content. There were articles that provided general insight into recent developments in VET policy in the EU, presenting problems and challenges using country-specific examples. Further, other articles explored cross-national variations with formally institutionalized "feedback mechanisms". There was also often a sector-specific focus, such as a study on VET in the construction sector comparing several European countries. Other articles focused on national VET systems, their structures, coherence, and educational reforms in specific European countries. Although the contents of this category differed greatly, their methodological approaches were similar and mostly employed comparative analyses.

Trampusch (2009) and Souto-Otero and Ure (2012) focused on a system-related perspective exploring how European VET policies were reflected in different national VET systems. The authors compared two countries based on a case study analysis. Trampusch (2009) analyzed the effects of the Copenhagen process on vocational training policy in Austria and Germany. Embedding the analysis of Europeanization in a more general analysis of institutional change and building upon a comparison of Germany and Austria, the author offered insights into two divergent dynamics of Europeanization in two similar VET systems. In Germany, Europeanization occurs as reform policies and politics. However, in Austria, Europeanization occurs more as institutional change by default, without strategically enacted reform initiatives shaped by the EU. Similarly, based on a two-country comparison, Souto-Otero and Ure (2012) explored differences in governmental ambition in Norway and Spain to increase coherence, defined as "the internal connections of individual educational strands and the points of contact between strands," (Souto-Otero & Ure, 2012, p. 92) of their VET systems. The authors provide two conceptualizations of coherence (vertical and horizontal coherence) and illustrated that while both countries sought coherence, the roots of their striving for it, the ways that they operationalized the term, and the emphasis of their actions differed substantially. This can be related to how VET interests and stakeholders are organized in each country. In comparison, Heikkinen (2004) determined the need to use a historical and contextual approach to understanding VET systems through discussions on continuing education in Nordic countries and Germany.

Following a comparative perspective, other studies focused on the investigation of the European VET policy convergence through specific elements, tools, and topics, e.g., "modularisation" and "formal feedback mechanisms". In a cross-country comparison, Pilz et al. (2018) compared the experiences of modularization in seven European countries. The authors described different pathways and indicated that while modularization in some countries takes a radical form, other countries follow a mixed approach. The authors concluded that no two countries have adopted the same form of modularization, yet some countries

have cited common challenges in the modularization process. Similarly, Markowitsch and Hefler (2018) addressed the topic of feedback-mechanism building through a comparative analysis of 15 European countries to enhance an understanding of cross-national variations in formally institutionalized "feedback mechanisms" between VET and the labor market. The study identified four different formal feedback mechanisms that represented the main types found in European countries: 1) The liberal model, explained by VET in England and higher VET in Austria; 2) the statist model, explained by school-based VET in Austria; 3) the participatory model, explained by VET in France; and 4) the coordinated model, explained by apprenticeship training in Germany and Austria. Other authors attended to different patterns of social dialogue over VET and their implications for qualifications and workforce mobility. For Winterton (2007), qualification and related processes played different roles and were given different degrees of attention in the agendas of social partners across countries, depending on the model of social partnership. For example, state-regulated systems (such as Germany and France) facilitate a clearly prescribed role for social partners, whereas market systems (such as Italy and the UK) are associated with uneven involvement. Social dialogue in school-focused systems (e.g., Italy and France) is inevitably less developed than in workplace-focused systems (e.g., Germany and the UK) because schooled VET is divorced from the domain where the social partners have the most competence.

Further, there were articles examining specific occupational foci or providing insights from micro-level perspectives. Clarke et al. (2020) drew on a study of VET regarding low-energy construction (LEC) developments in 10 countries (Belgium, Bulgaria, Finland, Germany, Hungary, Ireland, Italy, Poland, Slovenia, and Spain), which analyzed current provisions in the context of near-zero energy building (NZEB) implementation, the construction labor market, workforce characteristics, and national VET systems. Roosmaa (2019) analyzed how the choice of upper-secondary education and training specialization, general or vocational, enabled future participation in non-formal education (NFE) based on EU Labour Force Survey data from 28 countries. Misra (2011) shed light on VET teacher training systems across European countries by offering insights into policies and approaches adopted in the EU to train VET teachers. Drawing on results from document analyses and interviews (e.g., with VET teachers, representatives from VET teacher unions, and VET policy makers at the government level), the author identified core VET teacher training challenges in Europe and recommended several strategies for the continuing professionalization of VET teachers.

Although most studies focused on the differences between the countries concerned and the EU Member States, some scholars provided insights into the integration and implementation of the Lisbon Strategy and differences between the partner countries[4]. For example, Masson (2007) provided an overview of recent developments and challenges faced by VET

4 The term "partner countries" refers to the use of the word in the context of the article. The term is not to be equated with the European Member States, it refers to the partner countries of the European Training Foundation (ETF) such as Serbia, Romania, Turkey, Tunisia, Hungary etc. (see Masson, 2007, p. 48f.).

systems in the Western Balkans, Turkey, and other countries covered by the "wider European neighborhood" policy. This results in diverse situations across the Union and new Member States and is even greater in partner countries. The results also establish that the messages from Copenhagen have already begun to take hold in some of these countries. Their systemic value has increased awareness and acted as a catalyst for reform.

(3) European VET Policy Implementation at the National Levels

Of the 30 identified articles, eight could be assigned to the third main category. A common theme of all articles in this category was the tracing of the Europeanization processes of VET systems. In this context, the impact of the European VET policy on specific education policy mechanisms or effects on the VET or education systems of specific national Member States were investigated. Thus, these studies examined the effects of the EU VET policy (decisions, directives, recommendations, etc.) on Member States and were conducted as country studies or case studies. Due to the consideration of such processes at a specific country level, only a limited summarizing consideration of the contents of the articles was feasible.

Some articles dealt with the impact of education policy processes at a supranational level (EU level), such as the Lisbon Strategy and the Copenhagen Process, to a national level. For example, Cort (2010) examined the interactions between the Copenhagen Process, European VET, and Danish VET policies. Based on analyses of policy documents, research reports, and social actor-level interviews, Cort highlighted institutional changes in VET. Consequently, she drew conclusions about potential changes that need long term consideration. In examining the impact of European policy processes, other articles addressed policy instruments in particular and their application in specific European Member States.

Deissinger (2015) focused on the institutional field of vocational education. Regarding the effects of the alignment of national VET systems, he analyzed supranational governance instruments in the context of the EQF. Using Germany as an example, he examined the forms and practices of nongovernmental institutions in the vocational education system and drew conclusions about their responsibility for preserving the culture of the dual system.

De Paor (2018) used the results of an explanatory case study in the context of the outcomes of Erasmus+ and the strategic partnership with QUAKE to examine the role of the professional development of teachers in VET. The findings, drawn from the views of Irish VET teachers, demonstrated the importance of the use of European tools such as ECVET in teachers' professional development, which can facilitate making professional development an integral part of the teaching and learning process, ensuring more successful adoption of educational change.

The effects of the Bologna Process on the Dutch dual higher education system were the focus of van Houten (2018). His analysis focused on the effects on employment opportunities in the labor market. In this context, it highlights opportunities and tensions in employment

relationships for students and employers. Through his findings, van Houten uncovered a gap between higher vocational education and secondary vocational education, which reduced the employability of low-skilled workers and contributed to the inequality of employment opportunities for vocational graduates.

Two of the articles dealt with the impact of European professional policy on professionalization processes of the heterogeneous professional group of adult educators and the standardization of the recognition of competences in this field. Mikulec (2019) analyzed the formulation of requirements for adult education by the European Union and examined their impact on Slovenian adult education. Within the framework of a document analysis, efforts to conceptualize the recognition processes of adult educators' professional competences in Slovenia were traced. He found that unified recognition processes were unlikely due to the unmanageable heterogeneity of professional roles and competences to be recognized. Paulos (2015) focused on the EU's contribution to the definition of adult education policy at a country level. Using the example of education policy structures in Portugal, the author explained that the professionalization of adult educators in Portugal was in a process of alignment. A need for evidence-based policies to create structures for the professional development of adult educators was identified.

Rein (2017) also dealt with competence recognition. His research related to the increasing science-related demand for company specialists and managers and the resulting design of the professionalization of these professions. By examining learning outcomes in dual vocational study programs in Germany, he found characteristics of overarching vocational competencies and defined relevant requirement areas in initial and continuing education and training. These are seen as important prerequisites for enabling the connectivity of qualifications and transitions within and between education systems.

Loogma (2016) dealt with educational policy mechanisms in general. This author explored the process of Europeanization of the VET policy in terms of policy learning and policy transfer in general. To make the implementation of these processes transparent, she examined the process of redesigning an educational space through the influences of Europeanization of VET policy, using Estonia as an example. In this case study, the increase in the implementation of VET institutions, the shift toward active learning by the EU, and the introduction of standardized policy instruments were made evident.

3.6 Limitations of the Systematization of the Content

We are aware that the three main categories presented above overlap somewhat with one another and with other topics identified in the sample. For that reason, the basic purpose of any literature review—that is, to compare contexts and provide a mapping of existing knowledge in a field—could be fulfilled only to a limited extent. In particular, some core topics adjacent

to the three main categories were European tools, policies, and instruments to govern VET, the professionalization of VET staff (teacher training, adult educators), and models and structures of VET (i.e., VET regimes). Other articles covered topics such as the modularization of VET or the Bologna process in higher education. At the same time, our analysis revealed no overarching (theoretical) framework or academic discipline upon which the articles had been built. Research in the field refers to various (educational) political contexts, contains reform strategies, and, in some cases, follows different methodological logics. Because the methodological approaches to research in the field exhibit fragmentation, any systematic literature review of this field would be characterized by certain challenges and may be regarded as an additional step in accessing and systematizing such a complex research topic.

4 Discussion and Conclusion

Research on European VET policy can be described as a highly heterogeneous field that challenges systematic investigations in the literature. In our pilot study, we found that the systematic literature review method was difficult to apply given numerous limitations and restrictions, which will be discussed critically and considered for future research in this field. In this section, we review our experience with the process of conducting a systematic review. We structured our discussion according to the four-step model as introduced in Section 2. Although more research is required, we highlight some lessons learned from our pilot study.

First, any systematic literature review should begin with a number of research questions and a clear scope. In the fragmented, heterogeneous field of European VET policy, research questions for systematic literature reviews should seek to help synthesize current knowledge and offer a state-of-the-art overview of research in the field. However, overly broad research questions can result in massive amounts of information, thereby making literature reviews unmanageable. Consequently, narrowing the scope of research and focusing on a subtopic or more specific research questions in the area of interest could be helpful (see for example, Caves et al., 2019). Beyond that, a type of review (e.g., narrative review, scoping review, meta-analyses) suitable to the scope should be chosen (e.g., Gessler & Siemer, 2020).

Second, data selection is a critical step for any systematic review, and our attempts to follow the process of a systematic literature review have highlighted several domain-specific challenges in data selection. Within the scope of our pilot study, we searched certain databases and focused only on double-blind peer-reviewed English journal articles. Our search was also restricted to a span of 20 years, and as a result, the search results were limited. Grey literature (e.g., working papers and conference presentations), which often provide new and current scientific findings (in this particular field), was not integrated into our review. Moreover, we excluded monographies, anthologies, and political documents, such as directives, recommendations, or guidelines, which are indispensable sources in the field. Based

on our pilot study, only a few articles covered a 20-year period of research. Moreover, some relevant research articles were clearly missing from our sample, although we are aware that such literature exists (e.g., Bohlinger, 2019; Brockmann et al., 2009). Our oversight can be explained by our selection criteria, which were highly restrictive. Combinations of search terms such as "VET" and "policy", "VET" and "governance", "VET" and "system" may have netted some of the more obvious titles in literature in the field. Unfortunately, a great deal was also excluded, such as articles on VET policy that do not contain the term "VET" or have titles where VET is paired with a relevant term (e.g., "competence"). Future research should focus on the selection of keywords and the overall search strategy. The selection of keywords should be derived from the research questions obtained from known primary studies and cross-checked in terms of terminology and cultural differences in cross-country studies. Depending on the purpose of the review, the search can be more comprehensive (scoping review) or selective (i.e., meta-analysis). For a comprehensive stand-alone literature review, the literature search should include multiple databases, be conducted with backward and forward searches, and include additional relevant literature indicated by snowballing or experts in the field, among other strategies.

Third, data processing needs to be extracted and synthesized in an accurate manner, suitable for the research questions. While our sample was small and extremely diverse in scope, it did not reflect the importance of the topic or the relevance of some literature in the field. For example, we decided against ranking the final list of articles according to their H-factor or the number of citations in Google Scholar. Moreover, as we excluded articles by international stakeholders such as the OECD or the European Commission, we are unable to derive any statement about the importance of the articles in our sample. Our general data extraction was an essential, helpful step to deconstruct the range of studies and facilitate their comparison. The central result of the application of the literature review method is that EU VET policy research is a heterogeneous field concerning academic disciplines, theories, and research approaches. As Barabasch and Wolf (2009) concluded in their study on policy transfer in VET, methodological research on European VET policy is equivalent to an investigative research approach because receiving access to information sources and background information is demanding. Furthermore, the interests of the individual countries in education policy are highly diverse; hence, political discourse can hardly be depicted in its entirety (e.g., Barabasch & Wolf, 2009, p. 23). Due to the inter- and transdisciplinary nature of our sample, the results of our analysis are more general, and we have only been able to provide a descriptive systematization in the field. Although we did not perform a detailed content analysis, our work marks a starting point for future research on this topic. Even Gessler and Siemer (2020) have underscored the importance of more quantitative reviews, and to be appropriate for statistical meta-analysis, studies have to be as similar as possible to the questions that they try to answer and the methods that they use. Considering the state of recent literature and our

initial findings, we believe that a scoping review or narrative review that involves applying qualitative analytical techniques for synthesis could be an appropriate method for further reviews on European VET policy.

Fourth, reporting data allows a presentation of the findings of a review and the process of conducting it. It allows other researchers to follow the same steps and potentially achieve the same results. The literature review should not only follow a clear structure that ties studies to key topics, characteristics, and categories, but also indicates opportunities and directions for future research.

In this paper, we have documented an attempt to conduct a systematic literature review in the field of international VET research with a focus on European VET policy. We aimed to explore the extent to which this method is helpful in mapping the current state of research and systematizing knowledge in this field. Our experiences with attempting systematic literature reviews have confirmed that the basic stages of the review process appear to be useful. However, some modifications and extensions could significantly improve its value as a research method for future studies on VET policy, especially in Europe. Although our study highlights some challenges and future directions regarding applying the method proposed by Gessler and Siemer (2020), our pilot study also revealed some issues relating to the topics addressed in the individual articles reviewed. The core topics in the field of VET governance and European VET policy are governance mechanisms and the impact of European VET policy and related policies, including learning outcomes, qualifications frameworks, the Copenhagen process, and, to some extent, the Bologna process. Moreover, one of the core topics refers to the analysis of systems and structures of VET, including VET models and the collaboration and cooperation of stakeholders, and conceptualizing the coherence in VET and VET teachers and trainers. These are the starting points for mapping the field of European VET policy.

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References

Ante, C. (2016). *The Europeanisation of vocational education and training*. Springer International Publishing.

Aveyard, H. (2010). *Doing a literature review in health and social care: A practical guide*. McGraw-Hill.

Barabasch, A., & Wolf, S. (2009). Die Policy-Praxis der Anderen. Policy-Transfer in der Bildungs- und Berufsbildungsforschung. *Zeitschrift für internationale Bildungsforschung und Entwicklungspäd-*

agogik, 32(4), 22–27. https://www.pedocs.de/volltexte/2014/9594/pdf/ZEP_4_2009_Barabasch_Wolf_Die_Policy_Praxis.pdf

Barabasch, A. (2010). Methodological and theoretical approaches to the study of governance and policy transfer in vocational education and training. *Research in Comparative and International Education*, *5*(3), 224–36. https://doi.org/10.2304/rcie.2010.5.3.224

Bohlinger, S. (2012). Qualifications frameworks and learning outcomes: Challenges for Europe's lifelong learning area. *Journal of Education and Work*, *25*(3), 279–297. https://doi.org/10.1080/13639080.2012.687571

Bohlinger, S. (2019). Ten years after. The "success story" of the European qualifications framework. *Journal of Education and Work*, *32*(4), 393–406. https://doi.org/10.1080/13639080.2019.1646413

Bohlinger, S., Dang, T., & Klatt, M. (2016). *Education policy: Mapping the landscape and scope*. Peter Lang.

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful literature review*. (2nd ed.). Sage.

Brockmann, M., Clarke, L., & Winch, C. (2009). Competence and competency in the EQF and in European VET systems. *Journal of European Industrial Training*, *33*, 8/9, 767–799. https://doi.org/10.1108/03090590910993634

Busemeyer, M. R., & Trampusch, C. (2011). Comparative political science and the study of education. *British Journal of Political Science*, *41*(2), 413–443. https://doi.org/10.1017/S0007123410000517

Caves, K. M., Baumann, S., & Renold, U. (2019). Getting there from here: A literature review on vocational education and training reform implementation. *Journal of Vocational Education & Training*, *73*(1)1–32. https://doi.org/10.1080/13636820.2019.1698643

Clarke, L., Sahin-Dikmen, M., & Winch, C. (2020). Overcoming diverse approaches to vocational education and training to combat climate change: The case of low energy construction in Europe. *Oxford Review of Education*, *46*(5), 1–8. https://doi.org/10.1080/03054985.2020.1745167

Clarke, L., & Winch, C. (2015). Have Anglo-Saxon concepts really influenced the development of European qualifications policy? *Research in Comparative and International Education*, *10*(4), 593–606. https://doi.org/10.1177/1745499915613247

Cort, P. (2010). Europeanisation and policy change in the Danish vocational education and training system. *Research in Comparative and International Education*, *5*(3), 331–343. https://doi.org/10.2304/rcie.2010.5.3.331

de Paor, C. (2018). Supporting change in VET: Teachers' professional development and ECVET learner mobility. *Empirical Research in Vocational Education and Training*, *10*(1), 1–13. https://doi.org/10.1186/s40461-017-0062-3

Deissinger, T. (2015). International education policy: Its influence on the conception of VET and the VET system in Germany. *Research in Comparative and International Education*, *10*(4), 607–621. https://doi.org/10.1177/1745499915613248

Emmenegger, P., Graf, L., & Trampusch, C. (2019). The governance of decentralised cooperation in collective training systems: A review and conceptualisation. *Journal of Vocational Education and Training*, *71*(1), 21–45. https://doi.org/10.1080/13636820.2018.1498906

Euler, D. (2013). Germany's dual vocational training system: A model for other countries? Bertelsmann Stiftung. https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/GP_Germanys_dual_vocational_training_system.pdf

Gessler, M., & Siemer, C. (2020). Umbrella review: Methodological review of reviews published in peer-reviewed journals with a substantial focus on vocational education and training research. *International Journal for Research in Vocational Education and Training*, *7*(1), 91–125. https://doi.org/10.13152/IJRVET.7.1.5

Greinert, W. D. (2004). European vocational training "systems"- some thoughts on the theoretical context of their historical development. *European Journal of Vocational Training*, *32*, 18–25.

Grollmann, P., & Ruth, K. (2006). The 'Europeanisation' of vocational education between formal policies and deliberative communication. *Research in Comparative and International Education*, *1*(4), 366–380. https://doi.org/10.2304/rcie.2006.1.4.366

Hart, C. (2018). Doing a literature review: Release the Research Imagination. (2nd ed.). Sage.

Heikkinen, A. (2004). Models, paradigms or cultures of vocational education. *European Journal of Vocational Training*, *32*, 32–44.

Kämäräinen, P. (2017). Learning from Europe and for Europe with David Raffe-insights into early years of European cooperation in vocational education and training research. *Journal of Education and Work*, *30*(7), 750-757. https://doi.org/10.1080/13639080.2017.1380754

Li, J., & Pilz, M. (2021). International transfer of vocational education and training: A literature review. *Journal of Vocational Education & Training*, *1–34*. https://doi.org/10.1080/13636820.2020.1847566

Loogma, K. (2016). Europeanization in VET policy as a process of reshaping the educational space. *International Journal for Research in Vocational Education and Training*, *3*(1), 16–28. https://doi.org/10.13152/IJRVET.3.1.5

Markowitsch, J., & Hefler, G. (2018). Staying in the loop: Formal feedback mechanisms connecting vocational training to the world of work in Europe. *International Journal for Research in Vocational Education and Training*, *5*(4), 285–306. https://doi.org/10.13152/IJRVET.5.4.3

Masson, J. R. (2007). The contribution of European vocational training policy to reforms in the partner countries of the European Union. *European Journal of Vocational Training*, *41*(2), 43–63.

Mewaldt, A. (2014). The market-oriented and integrative management model for successful internationalisation of vocational education and training services. *Journal of Service Science*, *7*(1), 53–70.

Mikulec, B. (2019). Competences of adult education professionals in the European and Slovene context. *Journal of Adult and Continuing Education*, *25*(1), 25–44. https://doi.org/10.1177/1477971418805502

Misra, P. K. (2011). VET teachers in Europe: Policies, practices and challenges. *Journal of Vocational Education and Training*, *63*(1), 27–45. https://doi.org/10.1080/13636820.2011.552732

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*, *6*(7). https://doi.org/10.1371/journal.pmed.1000097

Oliver, D. (2010). Complexity in vocational education and training governance. *Research in Comparative and International Education*, *5*(3), 261–273. https://doi.org/10.2304/rcie.2010.5.3.261

Paulos, C. (2015). Qualification of adult educators in Europe: Insights from the Portuguese case. *International Journal for Research in Vocational Education and Training*, *2*(1), 26–38. https://doi.org/10.13152/IJRVET.2.1.2

Pierre, P., & Peters, B. G. (2005). *Governing complex societies: Trajectories and scenarios*. Palgrave Macmillan.

Pilz, M., Li, J., Canning, R., & Minty, S. (2018). Modularisation approaches in initial vocational education: Evidence for policy convergence in Europe? *Journal of Vocational Education and Training*, *70*(1), 1–26. https://doi.org/10.1080/13636820.2017.1392994

Rauner, F., & Wittig, W. (2010). Differences in the organisation of apprenticeship in Europe: Findings of a comparative evaluation study. *Research in Comparative and International Education*, *5*(3), 237–250. https://doi.org/10.2304/rcie.2010.5.3.237

Rein, V. (2017). Towards the compatibility of professional and scientific learning outcomes: Insights and options in the context of competence orientation. *International Journal for Research in Vocational Education and Training*, *4*(4), 325–345. https://doi.org/10.13152/IJRVET.4.4.2

Roosmaa, E. L., Martma, L., & Saar, E. (2019). Vocational upper-secondary education and participation in non-formal education: A comparison of European countries. *International Journal of Lifelong Education*, *38*(3), 268–286. https://doi.org/10.1080/02601370.2019.1586779

Ryan, C., Bergin, M., Titze, S., Ruf, W., Kunz, S., & Wells, J. S. (2018). ECVET and ECTS credit equivalency in higher education–A bridge too far? *European Journal of Education*, *53*(4), 600–610. https://doi.org/10.1111/ejed.12297

Šćepanović, V., & Artiles, A. M. (2020). Dual training in Europe: A policy fad or a policy turn? *Transfer: European Review of Labour and Research*, *26*(1), 15–26. https://doi.org/10.1177/1024258919898317

Smith, P. J., & Smith, S. N. (1999). The Internationalisation of Vocational Education and Training. Review of Research. National Centre for Vocational Education Research.

Souto-Otero, M., & Ure, O. B. (2012). The coherence of vocational education and training in Norway and Spain: National traditions and the reshaping of VET governance in hybrid VET systems. *Compare: A Journal of Comparative and International Education*, *42*(1), 91–111. https://doi.org/10.1080/03057925.2011.628836

Trampusch, C. (2009). Europeanization and institutional change in vocational education and training in Austria and Germany. *Governance*, *22*(3), 369–395. https://doi.org/10.1111/j.1468-0491.2009.01444.x

Tran, L. T. (2013). Internationalisation of vocational education and training: An adapting curve for teachers and learners. *Journal of Studies in International Education*, *17*(4), 492–507. https://doi.org/10.1177/1028315312469987

Ure, O. B. (2015). Governance for learning outcomes in European policy-making. Qualification frameworks pushed through the open method of coordination. *International Journal for Research in Vocational Education and Training*, *2*(4), 268–283. https://doi.org/10.13152/IJRVET.2.4.2

van Houten, M. M. (2018). Vocational education and the binary higher education system in the Netherlands: Higher education symbiosis or vocational education dichotomy? *Journal of Vocational Education & Training*, *70*(1), 130–147. https://doi.org/10.1080/13636820.2017.1394359

Viertel, E. (2010). Vocational education for sustainable development: An obligation for the European Training Foundation. *European Journal of Education*, *45*(2), 217–235. https://doi.org/10.1111/j.1465-3435.2010.01426.x

Walkenhorst, H. (2005). Europeanisation of the German education system. *German Politics*, *14*(4), 470–486. https://doi.org/10.1080/09644000500340644

Winterton, J. (2007). Building social dialogue over training and learning: European and national developments. *European Journal of Industrial Relations*, *13*(3), 281–300. https://doi.org/10.1177/0959680107081742

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Appendix

Included Papers

#	Name	Title	Year	Journal	Category
1	Bohlinger, S.	Qualifications frameworks and learning outcomes: Challenges for Europe's lifelong learning area	2012	Journal of Education and Work	Governance in European VET policy at the EU-system level
2	Clarke, L., Sahin-Dikmen, M., & Winch, C.	Overcoming diverse approaches to vocational education and training to combat climate change: The case of low energy construction in Europe	2020	Oxford Review of Education	European VET policy and cross-country comparison in the EU
3	Clarke, L., & Winch, C.	Have Anglo-Saxon concepts really influenced the development of European qualifications policy?	2015	Research in Comparative & International Education	Governance in European VET policy at the EU-system level
4	Cort, P.	Europeanisation and policy change in the Danish vocational education and training system	2010	Research in Comparative and International Education	European VET policy implementation at national level
5	de Paor, C.	Supporting change in VET: Teachers' professional development and ECVET learner mobility	2018	Empirical Research in Vocational Education and Training	European VET policy implementation at national level
6	Deissinger, T.	International education policy: Its influence on the conception of VET and the VET system in Germany	2015	Research in Comparative and International Education	European VET policy implementation at national level

7	Emmenegger, P., Graf, L., & Trampusch, C.	The governance of decentralised cooperation in collective training systems: A review and conceptualisation	2019	Journal of Vocational Education & Training	Governance in European VET policy at the EU-system level
8	Greinert, W. D.*	European vocational training "systems"- Some thoughts on the theoretical context of their historical development	2004	European Journal of Vocational Training	Governance in European VET policy at the EU-system level
9	Grollmann, P., & Ruth, K.	The 'Europeanisation' of vocational education between formal policies and deliberative communication	2006	Research in Comparative & International Education	Governance in European VET policy at the EU-system level
10	Heikkinen, A.*	Models, paradigms or cultures of vocational education	2004	European Journal of Vocational Training	European VET policy and cross-country comparison in the EU
11	Kämäräinen, P.	Learning from Europe and for Europe with David Raffe - insights into early years of European cooperation in vocational education and training research	2017	Journal of Education and Work	Governance in European VET policy at the EU-system level
12	Loogma, K.	Europeanization in VET policy as a process of reshaping the educational space	2016	International Journal for Research in Vocational Education and Training	European VET policy implementation at national level
13	Markowitsch, J., & Hefler, G.	Staying in the loop: Formal feedback mechanisms connecting vocational training to the world of work in Europe	2018	International Journal of Research in Vocational Education and Training	European VET policy and cross-country comparison in the EU
14	Masson, J. R.	The Contribution of European vocational training policy to reforms in the partner countries of the European Union	2007	European Journal of Vocational Training	European VET policy and cross-country comparison in the EU
15	Mikulec, B.	Competences of adult education professionals in the European and Slovene context	2019	Journal of Adult and Continuing Education	European VET policy implementation at national level
16	Misra, P. K.	VET teachers in Europe: Policies, practices and challenges	2011	Journal of Vocational Education & Training	European VET policy and cross-country comparison in the EU
17	Oliver, D.	Complexity in vocational education and training governance	2010	Research in Comparative and International Education	Governance in European VET policy at the EU-system level
18	Paulos, C.	Qualification of adult educators in Europe: Insights from the Portuguese case	2015	International Journal of Research in Vocational Education and Training	European VET policy implementation at national level
19	Pilz, M., Li, J., Canning, R., & Minty, S.	Modularisation approaches in Initial Vocational Education: Evidence for policy convergence in Europe?	2018	Journal of Vocational Education & Training	European VET policy and cross-country comparison in the EU
20	Rauner, F., & Wittig, W.	Differences in the organisation of apprenticeship in Europe: Findings of a comparative evaluation study	2010	Research in Comparative and International Education	Governance in European VET policy at the EU-system level

21	Rein, V.	Towards the compatibility of professional and scientific learning outcomes: Insights and options in the context of competence orientation	2017	International Journal of Research in Vocational Education and Training	European VET policy implementation at national level
22	Roosmaa, E. L., Martma, L., & Saar, E.	Vocational upper-secondary education and participation in non-formal education: a comparison of European countries	2019	International Journal of Lifelong Education	European VET policy and cross-country comparison in the EU
23	Ryan, C., Bergin, M., Titze, S., Ruf, W., Kunz, S., & Wells, J. S.	ECVET and ECTS credit equivalency in higher education–A bridge too far?	2018	European Journal of Education	Governance in European VET policy at the EU-system level
24	Scepanovi, V., & Artiles, A. M.**	Dual training in Europe: A policy fad or a policy turn?	2020	Transfer, The European Review of Labour and Research	Governance in European VET policy at the EU-system level
25	Souto-Otero, M., & Ure, O. B.	The coherence of vocational education and training in Norway and Spain: National traditions and the reshaping of VET governance in hybrid VET systems	2012	Compare: A Journal of Comparative and International Education	European VET policy and cross-country comparison in the EU
26	Trampusch, C.	Europeanization and institutional change in vocational education and training in Austria and Germany	2009	Governance: An International Journal of Policy, Administration, and Institutions	European VET policy and cross-country comparison in the EU
27	Ure, O. B.	Governance for learning outcomes in European policy-making: Qualification frameworks pushed through the open method of coordination	2015	International Journal for Research in Vocational Education and Training	Governance in European VET policy at the EU-system level
28	van Houten, M. M.	Vocational education and the binary higher education system in the Netherlands: Higher education symbiosis or vocational education dichotomy?	2018	Journal of Vocational Education and Training	European VET policy implementation at national level
29	Viertel, E.	Vocational education for sustainable development: An obligation for the European Training Foundation	2010	European Journal of Education	Governance in European VET policy at the EU-system level
30	Winterton, J.	Building social dialogue over training and learning: European and national developments	2007	European Journal of Industrial Relations	European VET policy and cross-country comparison in the EU

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Research in International Transfer of Vocational Education and Training – A Systematic Literature Review

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Abstract

Context: The transfer of vocational education and training (VET) has a long tradition and can be based on various conceptual and methodical approaches. Transfer process and success can be influenced by numerous factors at different levels (systemic, institutional and individual). However, the existing research on the challenges and success factors of VET transfer is very heterogenous and fragmented.

Method: To provide a comprehensive and structured overview of the current state of the international research on transfer in the context of VET, we conducted a literature review, which is presented here. Using the method of systematic literature review, a total of 231 studies were found and 41 studies were selected based on the defined criteria for full text analysis.

Findings: Various specific research foci and analytical approaches used on the included studies were identified and documented. The transfer of a dual VET system or its elements is based on different approaches and perspectives of the recipient country and the transferee. Major challenges for the transfer of dual VET systems include the social reputation of VET in the recipient countries and (language- and culture-related) communication difficulties between the involved parties. For a successful transfer of VET, a deeper knowledge of the contextual conditions in the recipient country are of particular importance, as well as a close, longstanding cooperation between the involved parties.

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Conclusion: The generated knowledge about key contextual conditions at the individual, company and systemic level in the context of VET transfer can provide a valuable basis for future VET cooperation.

Keywords: Vocational Education and Training, VET, Transfer, Literature Review, Professional Competence, Success Factors

1 Theoretical Background to Research in International 'VET Transfer'

The process of internationalization is becoming increasingly important in the area of vocational education and training (VET) (Frommberger & Baumann, 2019). In particular, international cooperation in VET has been regarded as an essential way of shaping internationalization for decades, as the practice of transferring educational structures internationally has a long tradition (Barabasch & Wolf, 2011; Frommberger & Baumann, 2019).

In this context, the transferability or exportability of VET systems or its elements to other countries has been investigated for many years, for instance (Barabasch & Wolf, 2011; Clement, 2012; Wiemann et al., 2019). Research and scientific studies in this area have increased in recent years (Dobischat & Düsseldorff, 2018), while numerous international cooperation projects have been ongoing for years, for example in the United States or India (Gessler, 2017; Pilz, 2016). In the literature, very different understandings, conceptualizations, and models of 'transfer' in VET research can be found. At the same time, rather limited knowledge about the heterogeneous models and approaches leads to a fragmentation of the research landscape (Wiemann et al., 2019). To bridge this gap, it is necessary to structure, systematize, compare and, if necessary, integrate different disciplinary research approaches.

In regard to the significance of the topic in terms of research, practice and policy, the primary goal of this article is to prepare a comprehensive, structured overview of the current state of international literature on transfer in the context of VET research. The authors systematically analyze the current international state of research on transfer with a multidisciplinary and multi-level perspective by using the method of "systematic literature review" (Gessler & Siemer, 2020; Grant & Booth, 2009). The identification of thematic and methodological foci and of semantic and/or structural links between the various approaches, theories and best practice models is a central focus of this article. Furthermore, indications of international networking and synergy potential in this field of research are taken into account.

Concept of (Professional) Competence and Understanding of VET Transfer

To provide a comprehensive and structured overview of the current state of international research and to analyze the multidisciplinary perspectives on transfer in the context of VET,

in a first step, it is necessary to define the understanding of the two core concepts in VET research, namely "transfer" and "(professional) competence".

With the globalization of the labor market, an increase in the importance of harmonized educational, and especially VET, systems became evident. This refers to the international innovation and competitiveness of organizations involved in VET as well as to the importance of ensuring competences for (international) professional mobility and self-reliant living of citizens and enabling lifelong learning, which is necessary in an increasingly changing societal and technological environment (e.g., Baethge et al., 2006; DIHK, 2015).

The harmonization trends in VET call for an internationally comparable (high) level of qualification in the respective national VET systems (e.g., Cedefop, 2011; Dunkel & Le Mouillour, 2013). In the last decade, the European Union has intensified its efforts to create more transparency within the VET systems in Europe and to regulate the harmonization of vocational qualifications with the development of the European Qualifications Framework (EQF) and the European Credit Transfer System (ECVET). Furthermore, as part of an international comparative feasibility study on VET (the so-termed 'VET PISA'), a large-scale assessment framework was developed in response to the increased importance of the VET systems to assess their learning outcomes, i.e. professional competencies. This feasibility study impressively showed that competences targeted in VET have to tow the line between meeting the requirements for both national particularities and international comparability (Baethge et al., 2006).

This tension also applies to the sense of the *transferability* of nationally established VET concepts to other countries. Since in-company instruction and training programs tend to be heterogeneous and less formalized, teaching-learning and examination approaches, adaptation and transfer in VET systems are accompanied by a variety of challenges (e.g., Kuper & Schrader, 2013).

The concept of *transfer* is defined differently in various disciplines and contexts (Gräsel, 2010). Educational transfer is based on the conceptual nuance of transference and is defined by Gessler (2012) as the transfer of educational ideas, structures, and practices from one system or institution to another. The term *transfer* in an educational context is primarily a term used in German-speaking countries, although *export* is also frequently used as a synonym (Geiben, 2017). In the international context, the general term *policy transfer* is primarily used to describe this concept (Wiemann et al., 2019). While policy transfer encompasses educational transfer, it is often described in a broader sense as the transfer of concepts or procedures. In addition, policy transfer can be further differentiated to refer to policy learning, policy borrowing, policy diffusion, policy reception and policy lending, depending on the academic discipline and the scope of the transfer (Dolowitz & Marsh, 1996; Geiben, 2017; Wiemann et al., 2019).

Referring to the definitional approaches, Geiben (2017, p. 23) defines transfer in the context of VET cooperation as "the transfer of ideas, practices and products as well as assumptions from one or more countries to one or more different countries." This article, which aims to comprehensively review existing research literature on this topic, is guided by this broad definition.

The VET system, for instance in German-speaking countries, represents a historically evolved complex constellation of participating institutions and actors that cannot easily be exported (Geiben et al., 2017; Strittmatter & Böhner, 2019). In the context of international VET research, many studies therefore concluded that the transfer of a VET system cannot take place as a one-to-one transfer (Stockmann, 2013; Stockmann & Silvestrini, 2013). In this regard, the transfer process cannot be seen as a copying process but needs to be designed as a selection and adaptation process that supports partner countries in adapting elements of their existing systems (Euler, 2013).

In this context, another important core concept in VET research, also at the international level, refers to the concept of competence. The term *competence* has become a fashionable term in the social and educational sciences (Klieme & Hartig, 2007). A broad use of this term can also be found in educational policy and research. However, the term *competence*, has different meanings in literature and everyday understanding, and it is neither used nor applied consistently in research and practice. Even in research dealing with educational and learning processes, *competence* is not defined synonymously, and is conceptualized and operationalized differently (Hartig, 2008; e.g., contributions in Blömeke et al., 2013).

The definition of the construct *competence* is a fundamental prerequisite for empirically sound investigations of learning and educational processes. However, it is precisely in the definition of competence as well as in the development of well-founded theoretical competence models that the challenges of empirical competence research become evident (e.g., Blömeke et al., 2015). These difficulties are partly due to the different and partly incompatible roots of the concept of competence across disciplines (Klieme & Hartig, 2007).

This is particularly true for VET that is characterized by a high heterogeneity of domains as well as participating institutions and actors. Moreover, the VET research is based on different (in parts nation-specific) traditions and conceptual and theoretical approaches, leading to a variety of (domain-specific) definitions of competence, including *(i)* competence in a purely organizational sense with regard to responsibility in an institution, *(ii)* psychological understanding of competence as disposition (e.g., professional knowledge), *(iii)* general understanding of competence as expertise, *(iv)* specific vocational skills or a holistic concept of (professional) performance (e.g., Shavelson, 2013).

In German-speaking countries, competence is often understood as the comprehensive ability to act and to master a specific (e.g., professional) situation, which can be subdivided, for instance, into domain-specific, personal, and social competence. This triad is specifically

taken up and further developed in German VET with the concept of 'vocational action competence' (Jude & Klieme, 2008; BiBB, 2010). In this context, action- and problem-oriented learning, the orientation toward professional competence in the sense of a broad holistic understanding of competence, as well as the training of trainers, and the development of cooperation between institutions involved in VET are established as core elements in the German dual training system (Angles & Lindemann, 2019).

In the current research, the German funding program ASCOT (Technology-based Assessment of Skills and Competences in VET) systematically analyzed, among others, competence characteristics of trainees at the end of their training. Based on technology-based assessment instruments for competence diagnostics (mostly computer-based simulations), evidence on the performance of trainees at the end of their VET is available for various occupations. The findings from the assessments indicate that the required higher-order skills such as problem-solving and reflective competencies are not consistently achieved in VET (see contributions in Beck et al., 2016; Seeber & Seifried, 2019).

Not only on a national level but also on an international level, there is a great variety in usage of the term *competence*, of definitions of competence, and its modeling. The diverse conceptualization of this term on an international level is also reflected in the various classification systems and systematizations of definitional approaches (e.g., Le Deist & Winterton, 2005; Mulder et al., 2007). In this context, classification systems for countries and regions show different approaches to defining competence with regard to VET, such as behavioral competencies including functional and cognitive competencies (USA), an occupational (functional) competence model including cognitive and behavioral competencies (UK), and more holistic approaches (France, Germany, and Austria) (Le Deist & Winterton, 2005).

To summarize, the concept of competence in international VET research is a prominent yet relatively new paradigm that is anchored in the respective socio-cultural context and, thus, shaped by national or even regional context- and domain-specificity. This makes the transfer of VET systems even more challenging.

2 Methodological Approach

2.1 Systematic Literature Review

The aim of a systematic literature review is to provide an overview of the current state of research on a particular topic and to draw theoretical and/or practical implications from it (Kitchenham & Charters, 2007; Xiao & Watson, 2017). In this context, Oakley (2017, p. xiii) highlights the benefits of a literature review compared to a single study: "The aim of syste-

matic research synthesis is to generate a more comprehensive and trustworthy picture of the topic being studied than is possible from individual studies".

This article presents a systematic analysis of the current international state of research on VET transfer with a multidisciplinary and multi-level perspective by following Gessler and Siemer (2020). According to their categorial definition, a systematic literature review covers the four following steps: (1) Definition of the scope, (2) data selection, (3) data processing, and (4) data reporting (Gessler & Siemer, 2020). The following part presents the literature review and its results according to these four categories.

2.2 Scope Definition

The *scope definition* specifies the research problem and derives central research questions. Within this literature review, the authors systematically analyze theoretical-conceptual as well as empirically oriented research on VET transfer with a multidisciplinary and multi-level perspective (Euler, 2019; Phillips & Ochs, 2003; Rappleye, 2006; Tanaka, 2005). The identification of thematic and methodological foci as well as semantic and/or structural links between the various approaches, theories and best practice models are a central focus of this article. Furthermore, indications of international networking and synergy potentials in the research field are taken into account. The central research aim of this literature review is to analyze the international state of research and to structure the knowledge base for the description of the object of investigation, "transfer research in VET," as well as a downstream analysis of its contextual conditions and determinants (i.e., major challenges and key success factors of transfer in international VET research).

2.3 Data Selection

The next step, *data selection*, entails a systematic search and eligibility screening. The sources and search terms have to be defined and the relevant research has to be selected, screened and read, whereas the ineligible research should be excluded. The determination of relevant sources to be included was done through a multi-step approach. To ensure a systematic and replicable approach to the analysis of the international state of research, central relevant literature databases such as Education Resources Information Centre (ERIC) and Google Scholar were used. In addition to the systematic literature search, the "snowball technique" was applied to collect additional references from identified papers (Waddington et al., 2012): After reviewing the first set of relevant literature, keywords and keyword combinations were determined to find further relevant publications. Thus, the approach of the review presented here is based on an extensive search from central education-research-specific online databases: Fachinfor-

mationssystem Bildung [Education Research Portal] (FIS Bildung), ERIC as well as the VET Literature Database of the BIBB [Federal Institute for VET] (LDBB) and Google Scholar.

Based on the research question, keywords were extracted to specify the search and to thus make it easier to identify relevant publications. Different authors (Bayliss & Beyer, 2015; Xiao & Watson, 2017) emphasize the importance of keywords in the search for relevant literature. In addition to the degree of precision of keywords, the use of the Boolean operators "AND" and "OR" is also crucial for a targeted search (Ritschl et al., 2016). In our search, the keywords listed below were combined by means of these logical links. Furthermore, the use of different terms within the national and international research landscape was taken into account, as the term transfer has different variations (see Table 1).

The identification of relevant studies was also complemented by drawing on project publications and reports as well as the "snowball system" to find additional literature to complement the formally published research (Adams et al., 2017). Especially in the context of vocational education, Haßler et al. (2019, p. 34) emphasize the importance of including different publication outlets, as "numerous important activities are not covered in professional journals." To find publications of this kind as well as other relevant studies, Google Scholar was used. In addition, using the snowball system meant that references in previously identified papers were sifted through, further contributing to the completeness of the documentation of the current state of research (Waddington et al., 2012; Xiao & Watson, 2017). Related terms and synonyms in the context of VET transfer were therefore also searched for. This approach led to the definition of a number of German and English keywords (see Table 1). This procedure also resulted in a large number of search results, as irrelevant literature could not be avoided in the hit list. Furthermore, due to searching several databases and using similar search strings, duplicates were also elicited, which were excluded in a first step (Sturma et al., 2016; Tonhäuser & Büker, 2016).

Table 1: List of Keywords in German and English

German Keywords:	**English Keywords:**
International	"Vocational Education and Training"
Berufsbildung	VET
Transfer	TVET
"internationale Zusammenarbeit"	"Dual Apprenticeship"
"Berufliche Bildung"	"Transfer of VET"
Internationalisierung	Transfer
Berufsbildungszusammenarbeit	"Policy Transfer"
Berufsbildungsexport	"Transfer of Training"
Berufsbildungstransfer	"German Dual System"
Berufsausbildung	International

"Duales Ausbildungssystem"	Internationalization
"Duales System"	"Comparative education"
Deutschland	"Educational transfer"
"Internationalisierung der Berufsbildung"	
"vergleichende Berufsbildungsforschung"	
Transferforschung	

2.4 Data Processing

The third step, *data processing*, focuses on critically assessing the quality of the selected literature to exclude unsuitable search results and to select the relevant data from the consulted resources, and then critically evaluate the (preliminary) selection of sources. This step also involves synthesizing and re-analyzing the selected data.

Accordingly, the next step of our literature review was to analyze the titles and abstracts of the publications identified by the database search with regard to their relevance. Obviously thematically irrelevant papers could then be excluded, while publications that were significant for answering our research question were examined more closely in their entirety. In addition, the relevant publications that were identified using the "snowball system" and the search for "gray literature" were also read in full.

Finally, the remaining articles were selected based on predefined inclusion criteria (Kitchenham & Charters, 2007; Sturma et al., 2016). To be included in the next step of the systematic review, studies had to meet the inclusion criteria listed below (see Table 2). Consequently, the criteria also served as exclusion criteria, i.e., if a study did not meet these criteria, it was excluded.

Table 2: Criteria for the In- and Exclusion of Studies

– The study is written in German or English.
– The study was published between 2010 and 2020.
– The thematic focus of the study is on transfer of VET systems and/or elements.
– The study has been published in a peer-reviewed journal or book

The final selection and systematization of the studies is based on a criterion-guided classification into several higher-level categories such as study focus, research method, sample, participating countries (for an overview, see Table 4 in appendix).

In the course of the systematic literature search, the selected search terms (see Table 1) were entered and combined both as keywords and as free text, as this approach proved to be particularly effective. In this way, a total of 331 studies were identified. Of these, 325 studies had been found through the database search, while the remaining studies resulted from the "snowball system" and the search engine Google Scholar. Since the databases are constantly updated, this can lead to a different number of hits for the search query at later dates.

Doublets were checked using the reference management program Citavi, and we subsequently conducted a duplicate comparison. This eliminated 100 doublets of potentially relevant and irrelevant studies, which resulted in a remaining number of 231 studies for the title–abstract screening, in which the relevance of the studies was assessed based on their titles and abstracts. After this screening, 140 publications were excluded from the review as it was evident from the title and/or abstract that they did not address the topic of VET transfer in a narrow sense. Among the remaining publications were studies that, for example, dealt with the transfer of knowledge from theory to professional practice (Frey et al., 2014) or focused on the international mobility of apprentices in the context of internationalization (Friedrich et al., 2010).

As a result, 91 studies remained that were deemed relevant. The full-text versions of these studies were obtained and read. Based on the predefined inclusion criteria (see Table 2), 41 relevant studies were identified that proved to be thematically and methodologically relevant and were therefore included in the present literature review. Thus, 50 publications were excluded which could not yet be rejected during the title–abstract screening, but which turned out to be less relevant in the full-text review. In addition, the analyses of the full texts revealed that relevant information ensuring the research quality of the studies, i.e., basic information on the method, sample size, and analysis approach, was often missing or not described sufficiently. Hence, about one dozen of the studies that initially appeared relevant could not be included in the review due to fundamental information missing and/or obscured.

Table 3: Criterion-Guided Literature Selection

Database	Hits	Doublets	Abstract Screening	Full-text Screening	Inclusion
FIS Bildung	59	100	231	91	41
ERIC	157				
LDBB	109				
Google Scholar	6				

2.5 Data Reporting

The final step of our systematic literature review focuses on *data reporting*, and it involves presenting the findings and implications as well as the limitations of the review and discussing the conclusions.

In the following section, an exemplary selection of the included studies is presented, taking into account theoretical or conceptual and application-oriented studies. The key findings and implications are presented and discussed as well. The final part of the step *data reporting*, namely presenting the limitations, is presented in Section 4.

3 The Current State of Research in VET Transfer

The aim of international VET research is to identify the central challenges in implementing innovation potentials in VET and to develop concrete action points to improve the structures of VET. Research on international VET is generally conducted at discipline level and national level, with corresponding delimitations, exclusions and limitations resulting in the fragmentation of the research landscape. VET research is highly diverse, which is reflected in the fragmentation of research approaches and disciplines, which are organized in very different ways internationally. Overall, limited international resources are available in the VET research field. The rather few available systematic reviews and evaluations of VET at the international level reveal significant research gaps. Furthermore, strong political and economic interests have led to the dominance of application-oriented research foci in VET research. Methodological research questions concerning the optimization of transfer possibilities outweigh fundamental theoretical and conceptual reflections on the nature of transfer processes in the present research landscape. With regard to specific topics, in recent years, international VET research has focused primarily on dual VET as well as "training-on-the-job" approaches, while hybrid qualifications with university and vocational components (Deißinger, 2015; Powell et al., 2012) have only recently received (renewed) attention.

The central research aim of our literature review is to analyze the international state of research and to structure the knowledge base for the description of the object of investigation "transfer research in VET", as well as to conduct a downstream analysis of its contextual conditions and determinants (i.e., challenges and success factors of transfer in international VET research). In the following part, the central key findings will be summarized and their implications for our research question will be discussed.

3.1 Key Findings

In the following, we present an exemplary selection of the included studies consisting of theoretical or conceptual and application-oriented studies. The 40 studies included in this research literature review (see Table 4 in appendix) address the topic at different levels. The majority of studies included (approximately three-quarters) deal with transfer processes on a systemic level and approximately one third examine transfer from a corporate or entrepreneurial perspective and/or at a VET institutional level; approximately one-sixth of the selected studies considered both levels. As defined in Section 2, all studies, regardless of their specific focus in the area of transfer research in VET, were initially included in the mapping procedure. To structure and systemize the studies and their findings, we summarize them and present key challenges and key success factors of VET transfer as stated in the research papers. Thereafter, the studies were categorized and classified according to their methodological approach, identifying six studies that addressed the topic of transfer on a theoretical-conceptual level, 30 studies that dealt with the topic empirically, and four meta-studies that examined transfer processes based on literature reviews or a meta-analysis (see Table 4 in appendix).

In the literature review, we identify several studies dedicated to the implementation of a dual VET system with different approaches. In addition to ideas for a possible business model to promote and commercialize dual vocational education (Jonda, 2012), other studies focus on VET policy transfer (Barabasch & Wolf, 2011), on piloting a scientific transfer model in practice (Bohlinger & Wolf, 2016), or they identify training strategies used by German companies abroad (Körbel et al., 2017).

Another central focus in various studies is the transfer recipient country and the perspective of the transferee (Barabasch & Wolf, 2010; Bohlinger & Wolf, 2016; Euler, 2019). Here, a common finding is that the understanding of duality needs to be clarified and core challenges need to be addressed as part of the design of the transfer process. The insight that the transfer cannot take place as a one-to-one copy is the result of many studies (Euler, 2013; Hummelsheim & Baur, 2014; Stockmann, 2013). Instead, VET transfer is about adapting to the context of the recipient country and introducing appropriate, for instance, dual training elements (Euler, 2013; Ramasamy, 2020).

The analysis of the research literature shows that there is not just one way of implementing specific, for example competence-oriented, training structures. Rather, there is a variety of different approaches to establishing VET elements (that are based on, e.g., the German model). Different VET elements can be introduced at different levels. The examined implementation approaches range from the development of a business model idea at the system level (Jonda, 2012) to the establishment of an autonomous qualification center at the individual company level (Krzywdzinski & Jürgens, 2019). Therefore, the analysis of the transfer conditions plays a major role in transfer approaches. These strategies include a systematic further

development of vocational education at the micro, meso and macro levels. According to the analyzed studies, the development of legal frameworks could be identified as an implementation measure on the macro level (Barabasch & Wolf, 2010, 2011; Krzywdzinski & Jürgens, 2019); on the meso and micro level, measures included the modification of certifications and curricula and the creation of further training measures for students and teachers (Bohlinger & Wolf, 2016; Krzywdzinski & Jürgens, 2019). The choice of the respective strategy is conditioned by internal as well as external influence factors, i.e., that the implementation or transfer approaches can vary considerably from country to country or even from company to company (Körbel et al., 2017).

3.2 Key Challenges in VET Transfer

One of the key challenges in the transfer of VET elements is the low social standing of the VET system in many countries. In this context, the included studies observed that the acceptance of VET institutions as an equitable alternative to academic education is low in many target countries (Fraunhofer MOEZ, 2012; Van der Burgt et al., 2014; Welfens, 2016). As a consequence, companies are less willing to invest in complex VET elements, which results in generally low investments in the VET system in the respective countries (Wiemann, 2020; Wiemann & Pilz, 2020).

Furthermore, a central challenge in VET transfer is rooted in communication difficulties (Fraunhofer MOEZ, 2012; Haering et al., 2014; Pfaffe, 2019). These communication barriers can be attributed to both linguistic and cultural differences (Li, 2017). For example, in many target countries there is a lack of English language skills on the part of trainees, trainers and project officers, which can have an aggravating effect on transfer activities (Haering et al., 2014). Since the transfer process requires a great deal of coordination between the involved parties, successful communication is essential (Peters, 2019a). Here, the support of technical, linguistic, and cultural experts in both the recipient and transferring countries is needed (Li, 2017).

In addition, some studies indicate that transfer activities can be met with distrust and resistance from different stakeholders (Bohlinger & Wolf, 2016; Krzywdzinski & Jürgens, 2019; Pfaffe 2019). This skepticism can be attributed to different causes: In addition to different traditions in the recipient countries to which the participants want to adhere, negative previous experiences with transfer activities can also lead to resistance (Bohlinger & Wolf, 2016; Krzywdzinski & Jürgens, 2019; Eichhorst et al., 2012).

3.3 Key Success Factors in VET Transfer

Beside the challenges listed above, the literature reviewed also reveals success factors for the transfer of VET elements to other contexts. According to numerous reviewed studies, knowledge of the contextual conditions and the resulting adaptation to the conditions in the target country is a prerequisite for the successful implementation of VET elements (Bliem et al., 2014; Fraunhofer MOEZ, 2012; Peters, 2019a, 2019b; Pfaffe, 2019). This is consistent with the notion that transfer must be a process of adaptation and adjustment. In this context, the example of Stockmann (2019) points to the importance of flexible project management that reacts to changing environmental conditions and does not stick too rigidly to the original model.

Furthermore, close cooperation between the involved parties is stated as an important basis for successful VET transfer (Aring, 2014; Gessler, 2019). Therefore, constant communication is necessary to prevent misunderstandings and conflicts of interest. Furthermore, a reliable basis of trust between the participants can be established through constant exchange (Peters, 2019b). This relationship-building is not limited to bilateral cooperation between national and international partners. All stakeholders involved should also cooperate closely with each other and show a similar understanding of as well as trust in the targeted transfer project.

In addition, the role of individuals and the competence of instructors as well as other decision-makers is an important influencing factor (Dowling et al., 2008). In particular, knowledge of how the relevant VET system works has a significant impact on the success of the transfer process (Wiemann & Pilz, 2020). Here, the participation of trained and experienced expatriates or trainers, especially at the beginning of the transfer activities, constitutes a positive influencing factor for a successful transfer (Körbel et al., 2017).

Another success factor consists of having a goal-oriented organization with transparent structures. In this context, it is important to clarify responsibilities and the associated accountability at both state and private-sector level (Bliem et al., 2014; Peters, 2019b; Stockmann, 2019). Considering the large number of actors involved in VET transfer, it is of great importance that the organizational structures and the distribution of tasks are presented transparently to create binding framework conditions for the dual system (Krekel & Walden, 2016).

A number of studies also draw attention to the importance of companies' willingness to provide training (Bliem et al., 2014; Gonon, 2014; Krekel & Walden, 2016). Only if companies are willing to invest in training activities can the potential of VET structures be tapped. To ensure the commitment of involved companies, the training costs incurred must be outweighed by corresponding training benefits for the companies (Bliem et al., 2014; Krekel & Walden, 2016; Langthaler, 2017).

3.4 Implications

The systematic literature review of international VET research indicates that ex-ante evaluations of key concepts and approaches underlying one particular VET system and its central contextual (e.g., socio-cultural) factors should be conducted before beginning a transfer process to assess the transfer project's chances of realization and at the same time to be able to provide effective training in accordance with the local labor market (demands) (e.g., Stockmann & Silvestrini, 2013). The primary objective of this evaluation is to provide a broad prospective analysis of both the situation in the transferee and recipient country before the transfer activities begin, so that possible barriers can be identified before they occur (Wiemann, 2020). In this context, an analysis of the various local institutions and actors involved should take place (e.g., Pilz, 2017). Gessler (2017) suggest that by analyzing the financial situation of potential trainees in advance, effective measures could be developed to create an incentive to take up and complete training. Furthermore, the respective national framework conditions must be examined, as these in turn impact the demand for specific training structures and targeted outcomes (Pilz, 2017). In addition, legal regulations and institutional responsibilities in the transferee countries must be evaluated in terms of whether they are compatible with the system in a recipient country.

The adaptation of VET approaches to the actual conditions in the target countries is closely linked to the aforementioned ex-ante evaluation of the contextual conditions. Adaptation processes require, in particular, flexibility in transfer that responds to the changing influencing factors (e.g., Stockmann, 2019; Wiemann & Pilz, 2020). It is essential that the reference model is not followed too rigidly and that appropriate adaptations are developed within a local cooperation (Wiemann & Pilz, 2020). As part of the adaptation processes, for instance the infrastructural requirements or the economic structures of the target country must be taken into account to adapt the transfer approach accordingly.

The results of the present analysis of the state of international VET research clearly show that individual persons involved in the transfer process, can have a great influence on VET transfer. The findings indicate that the professional expertise of the actors involved should be examined and, if competences are lacking, measures should be established to effectively address these deficits. In particular, the training of teaching staff is of great importance in the context of VET transfer. The quality of trainers can be consequently improved through higher-level training or education opportunities based on international standards (e.g., Gessler, 2019; Körbel et al., 2017; Peters, 2019b).

Another important aspect to ensure successful international cooperation and VET transfer is the communication between participants involved. Particularly with regard to the sustainability of the transfer process, continuous communication and cooperation between VET practitioners from various institutions is required. In this context, the socio-cultural impact of communication is often underestimated, giving way to misunderstandings (e.g., Lange &

Hohnwald, 2008). As a result, in the course of VET transfer, the communication culture of the countries and institutions involved should be examined and considered in the adaption to the recipient country (Li, 2017). For instance, when translating into local languages, it should be ensured that the translators are familiar with the cultures involved and can thus assure a translation that is appropriate to the meaning, i.e., functional equivalence (Li, 2017).

The research analysis suggests that communication is a central influencing factor in VET cooperation and transfer on several levels. For example, transparent organization of responsibilities should ensure communication between various stakeholders, including the state, private businesses, trade unions, educational institutions, educational staff, and trainees. Therefore, instruments that enable or promote the exchange between the participants involved are required, and relatively flat hierarchies and constant communication should be paid attention to (Kenzhegaliyeva, 2018). In the future, digital solutions to support supra-regional communication and cooperation in VET should be further developed and systematically implemented.

4 Limitations and Outlook

This section outlines limitations of the presented literature review in terms of theoretical and methodological issues as well as regarding the systematic processing and analysis of the studies. Finally, an outlook on further research needs is provided.

Although the review was guided by established methodological and research standards to ensure a methodologically sound approach, it cannot be ruled out that some relevant studies were not found and included (Sturma et al., 2016). Although the systematic search approach using several keyword combinations in different databases reduced the likelihood that relevant studies were disregarded, there is still a risk that relevant publications were not included in the present literature review (Ritschl et al., 2016). In general, using the inclusion criteria applied may be accompanied by the exclusion of potentially relevant studies. This might be due to the fact that only publications in German and English were included in the review, thus possibly leading to an exclusion of relevant literature in other languages. In addition, only studies published in a specific time period (2010-2020) were considered. These decisions were necessary due to time and cost constraints and for efficiency reasons, as a translation of studies published other languages would have exceeded the available scope. However, since the transfer of VET is controversially discussed internationally and hence there may be literature available in languages other than German or English, it would be interesting to consider these studies in future work.

As a further general limitation, Sturma et al. (2016) emphasize that the involvement of several people in the search, selection and evaluation process can significantly increase the objectivity and thus the quality of the literature review. Thus, the objectivity of the sub-pro-

cesses of the present review must be considered critically, as both the choice of databases and the formulation of the inclusion criteria are based on the national perspective of the authors. The same applies to the definition of the keywords and the literature search itself. The objectivity of the present work could have been increased by involving external experts from the same research discipline in the process, especially when creating the search terms (Klatt, 2019).

There might also be limitations regarding the processing and analysis of the included studies. As the literature review using a narrative approach by Li and Pilz (2021) has shown, VET transfer research is based on various academic disciplines. Overall, Li and Pilz (2021) provide a broad understanding of VET transfer and underline the high complexity and challenges of VET transfer. In the review presented here, we used a similar broad approach to transfer in VET in our analysis. The studies included here can certainly be analyzed in greater depth. One common finding regarding the methodology of the assessed literature is that the majority of the included publications is based on a case-study approach (Gessler et al., 2019; Krzywdzinski & Jürgens, 2019; Peters, 2019a). This method is not without controversy, and its representativeness and generalizability are often challenged (Hildenbrand, 1991; Simons, 2009). In addition, there is criticism that case studies often show a certain inaccuracy and lack of objectivity (Rowley, 2002; Yin, 2009). However, case studies allow for "deep insights into the object of investigation" (Peters, 2019b, p. 83) and accurate and in-depth research in socio-political contexts (Kelle & Kluge, 2010).

Overall, the studies examined differ in their methodology and in their sample composition, in some cases considerably. The broad mapping approach was chosen to obtain a comprehensive overview of the current state of research. However, this affects the comparability of the results. Even though the present study attempted to systematically arrange the studies according to the level at which they address transfer, it cannot be assumed that their respective results are directly comparable with each other. For future reviews, it would be conceivable to include only those studies that are based on the same methodology and/or focus on the same source and recipient countries.

Furthermore, our analyses demonstrate a general limitation: a significant number of the studies screened during the literature review did not provide sufficient fundamental information that would be expected by any research publication, i.e., precise descriptions of research methods, procedures used, sample descriptions, materials, and evaluation approaches (see also Section 2.4). This limitation indicates that higher compliance with research quality standards need to be ensured for the future publication of research results in this area. This is also a necessary prerequisite to ensure stronger connectivity of studies to the current state of research as well as replicability of the findings. A greater emphasis should be placed on the call for these requirements in the future research in this field.

One focus of this review was the German dual VET system as a transfer object. In future research, it would be useful to compare the implementation approaches and success conditions for the transfer of the German VET system to those for the transfer of comparable dual vocational training systems. In this way, fruitful findings regarding the respective vocational training transfers could be made compatible for practitioners in the field of VET cooperation.

In general, the majority of the included studies is based on an investigation of a recipient country or company. Future research activities should therefore focus more on a comparative approach that compares and analyzes the transfer of dual vocational training in different countries and/or companies.

Despite these limitations, the present work succeeded in combining and analyzing research publications on the transfer of VET systems with regard to implementation approaches and the framework of conditions at different levels of observation. Thus, a comprehensive overview of implementation approaches and conditions for success was provided, which offers important insights for VET practitioners. The generated knowledge about important contextual conditions on an individual, company and systemic level in the context of vocational training transfer can offer numerous starting points for future vocational training cooperation or vocational training export to make transfer even more target-oriented. There is no single solution – but versatile approaches and strategies can serve as orientation aids to enable the successful transfer of vocational training systems across borders in the future.

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References

Adams, R. J., Smart, P., & Huff, A. S. (2017). Shades of grey: Guidelines for working with the grey literature in systematic reviews for management and organizational studies. *International Journal of Management Review*, *19*(4), 432–454. https://doi.org/10.1111/ijmr.12102

Angles, E., & Lindemann, H. J. (2019). Professionalisierung der dualen Berufsausbildung in Peru. In M. Gessler, M. Fuchs & M. Pilz (Eds.), *Konzepte und Wirkungen des Transfers Dualer Berufsausbildung* (pp. 463–513). Springer VS. https://doi.org/10.1007/978-3-658-23185-9_13

Aring, M. (2014). *Innovations in quality apprenticeships for high-skilled manufacturing jobs in the United States: At BMW, Siemens, Volkswagen*. ILO. http://hdl.voced.edu.au/10707/308215

Baethge, M., Achtenhagen, F., Arends, L., Babic, E., Baethge-Kinsky, V., & Weber, S. (2006). *Berufsbildungs-PISA Machbarkeitsstudie*. Franz Steiner Verlag.

Barabasch, A., & Wolf, S. (2010). VET Policy Transfer in Ägypten, Malaysia und Korea. In E. Wuttke (Eds.), *Schriftenreihe der Sektion Berufs- und Wirtschaftspädagogik der Deutschen Gesellschaft für*

Dimensionen der Berufsbildung: Bildungspolitische, gesetzliche, organisationale und unterrichtliche Aspekte als Einflussgrößen auf berufliches Lernen (pp. 123–134). Budrich.

Barabasch, A., & Wolf, S. (2011). Internationaler Policy Transfer in der Berufsbildung. *Zeitschrift für Erziehungswissenschaften*, *14*(2), 283–307. https://doi.org/10.1007/s11618-011-0202-7

Batliner, R. (2014). Adapting the dual system of vocational education and training. In M. Maurer & P. Gonon (Eds.), *The challenges of policy transfer in vocational skills development – national qualifications frameworks and the dual model of vocational training in international cooperation* (pp. 285–302). Peter Lang. https://doi.org/10.3726/978-3-0351-0758-6

Bayliss, H. R., & Beyer, F. R. (2015). Information retrieval for ecological syntheses. *Research Syntheses Methods*, *6*(2), 136–148. https://doi.org/10.1002/jrsm.1120

Beck, K., Landenberger, M., & Oser, F. (2016). *Technologiebasierte Kompetenzmessung in der beruflichen Bildung [Technology-based assessment of skills and competences in vocational education and training]*. Bertelsmann. https://doi.org/10.3278/6004436w

Bundesinstitut für Berufsbildung. (BiBB) (2010). Kompetenzdiagnostik in der Berufsbildung: Begründung und Ausgestaltung eines Forschungsprogramms. *Berufsbildung in Wissenschaft und Praxis - BWP, 2010*(1). https://www.bibb.de/dienst/veroeffentlichungen/de/publication/show/6215

Bliem, W., Schmid, K., & Petanovitsch, A. (2014). *Erfolgsfaktoren der dualen Ausbildung: Transfermöglichkeiten* (iwb-Forschungsbericht, Nr. 177). Institut für Bildungsforschung der Wirtschaft. https://ibw.at/bibliothek/id/259/

Blömeke, S., Gustafsson, J.-E., & Shavelson, R. J. (2015). Beyond dichotomies: Competence viewed as a continuum. *Zeitschrift für Psychologie*, *223*(1), 3–13. https://doi.org/10.1027/2151-2604/a000194

Blömeke, S., Zlatkin-Troitschanskaia, O., Kuhn, C. & Fege, J. (Eds.) (2013). *Modeling and measuring competencies in higher education: Tasks and challenges*. Sense Publishers. https://doi.org/10.1007/978-94-6091-867-4

Bohlinger, S., & Wolf, S. (2016). Zwischen Dynamik und Stagnation. Politiktransfer kooperativer Berufsausbildung als Weg aus der Jugendarbeitslosigkeit in Südeuropa. *Zeitschrift für Pädagogik*, *62*(3), 340–357. http://dx.doi.org/10.25656/01:16762

Caves, K. M., Baumann, S., & Renold, U. (2019). Getting there from here: A literature review on vocational education and training reform implementation. *Journal of Vocational Education & Training*, *73*(1). https://doi.org/10.1080/13636820.2019.1698643

European Centre for the Development of Vocational Training. (Cedefop) (2011). *Shaping lifelong learning: Making the most of European tools and principles*. Briefing note.

Clement, U. (2012). Berufsbildung in der deutschen Entwicklungszusammenarbeit. *Zeitschrift für Berufs- und Wirtschaftspädagogik*, *108*(1), 93–107.

Deißinger, T. (2015). The German dual vocational education and training system as 'good practice'? *Local Economy*, *30*(5), 557–567. https://doi.org/10.1177/0269094215589311

DIHK. (Association of German Chambers of Industry and Commerce) (2015). *Ausbildung 2015. Ergebnisse einer DIHK-Online-Unternehmensbefragung*. https://www.dihk.de/ressourcen/downloads/dihk-ausbildungsumfrage-2015.pdf

Dobischat, R., & Düsseldorff, K. (2018). Berufliche Bildung und Berufsbildungsforschung. In R. Tippelt & B. Schmidt-Hertha (Eds.), *Handbuch Bildungsforschung* (4. Ed., pp. 457–484). Springer VS.

Dolowitz, D., & Marsh, D. (1996). Who Learns from whom: A review of the policy transfer literature. *Political Studies*, *44*(2), 343–357. https://doi.org/10.1111/j.1467-9248.1996.tb00334.x

Dowling, P. J., Festing, M., & Engle, A. D. (2008). *International human resource management: Managing people in a multinational context*. Cengage Learning.

Dunkel, T., & Le Mouillour, I. (2013). *Berufsbildung auf höchstem Niveau – europäische Erfahrungen*. Bundesinstitut für Berufsbildung.

Eichhorst, W., Rodriguez-Planas, N., Schmidl, R., & Zimmermann, K. F. (2012). *A roadmap to vocational education and training systems around the world*. IZA. https://www.iza.org/publications/dp/7110/a-roadmap-to-vocational-education-and-training-systems-around-the-world

Euler, D. (2013). Die deutsche Berufsausbildung – ein Exportschlager oder eine Reformbaustelle? *Zeitschrift für Berufs- und Wirtschaftspädagogik*, *109*(3), 321–331.

Euler, D. (2019). Duale Berufsausbildung – ein Exportschlager ohne Absatz? In M. Pilz, K. Breuig, S. Schumann (Eds.), *Berufsbildung zwischen Tradition und Moderne: Festschrift für Thomas Deißinger zum 60. Geburtstag* (pp. 315–329). Springer VS.

Flynn, M., Pillay, H., & Watters, J. (2015). Boundary crossing – A theoretical framework to understand the operational dynamics of industry-school partnerships. *TVET@Asia*, *5*, 1–17.

Fortwengel, J., & Jackson, G. (2016). Legitimizing the apprenticeship practice in a distant environment: Institutional entrepreneurship through inter-organizational networks. *Journal of World Business*, *51*(6), 895–909. https://doi.org/10.1016/j.jwb.2016.05.002

Fraunhofer-Zentrum für Mittel- und Osteuropa MOEZ. (2012). *Treibende und hemmende Faktoren im Berufsbildungsexport aus Sicht deutscher Anbieter*. https://www.berufsbildungsexport-meta.de/system/publications/documents/000/000/001/original/FraunhoferMOEZ_Studie_Treiber_Hemmnisse_finala6e1a6e1.pdf?1371046861

Frey, A., Balzer, L., & Ruppert, J. J. (2014). Transferable competences of young people with a high dropout risk in vocational training in Germany. *International Journal of Educational and Vocational Guidance*, *14*(1), 119–134. https://doi.org/10.1007/s10775-013-9257-8

Friedrich, W., Körbel, M., & Möller, K. (2010). *Untersuchung der Auswirkungen von Mobilitätsprojekten des Programms Leonardo Da Vinci auf die Qualität von Systemen der beruflichen Aus- und Weiterbildung. Abschlussbericht*. https://op.europa.eu/en/publication-detail/-/publication/563ecb28-b0c3-4982-93f1-ce595b15698a/language-de/format-PDF/source-117498049

Frommberger, D., & Baumann, F.-A. (2019). Internationalisierung der Berufsbildung. In R. Arnold, A. Lipsmeier & M. Rohs (Eds.), *Handbuch Berufsbildung* (3. Ed., pp. 713–724). Springer VS. https://doi.org/10.1007/978-3-658-19372-0_54-1

Fuchs, M. (2020). MNCs' open international strategy – local dynamics: Transfer of German "vocational education and training" to emerging economies. *Critical Perspectives on International Business*. https://www.emerald.com/insight/content/doi/10.1108/cpoib-12-2019-0106/full/html

Geiben, M. (2017). Geschichtliche und begriffliche Annäherung an die Thematik. In M. Geiben (Eds.), *Transfer in internationalen Berufsbildungskooperationen* (pp. 17–28). Bertelsmann Verlag. https://www.bibb.de/dienst/veroeffentlichungen/de/publication/show/8557

Geiben, M., Le Mouillour, I., & Thomann, B. (2017). Herausforderungen von Berufsbildungskooperationen und (Wissens-)Transfer im internationalen Kontext – "Alter Wein in neuen Schläuchen"? In M. Geiben (Eds.), *Transfer in internationalen Berufsbildungskooperationen* (pp. 7–14). Bertelsmann Verlag.

Gessler, M. (2012). Lerntransfer in der beruflichen Weiterbildung – empirische Prüfung eines integrierten Rahmenmodells mittels Strukturgleichungsmodellierung. *Zeitschrift für Berufs- und Wirtschaftspädagogik, 108*(3), 362–393.

Gessler, M. (2017). Educational transfer as transformation: A case study about the emergence and implementation of dual apprenticeship structures in a German automotive transplant in the United States. *Vocations and Learning*, *10*, 71–99. https://doi.org/10.1007/s12186-016-9161-8

Gessler, M. (2019). Promotoren der Innovation im transnationalen Berufsbildungstransfer: Eine Fallstudie. In M. Gessler, M. Fuchs & M. Pilz (Eds.), *Konzepte und Wirkungen des Transfers Dualer Berufsausbildung* (pp. 231–279). Springer VS. https://doi.org/10.1007/978-3-658-23185-9_7

Gessler, M., Fuchs, M., & Pilz, M. (2019). Der internationale Berufsbildungstransfer im Lichte der deutschen Berufsbildungsforschung: Wie der Geist aus der Flasche. In M. Gessler, M. Fuchs & M. Pilz (Eds.), *Konzepte und Wirkungen des Transfers Dualer Berufsausbildung* (pp. 3–10). Springer VS.

Gessler, M., & Peters, S. (2020). Competency-based education and training in Namibia: Educational transfer as imitation. In M. Pilz & J. Li (Eds.), *Comparative vocational education research. Internationale Berufsbildungsforschung* (pp.113–130). Springer VS. https://doi.org/10.1007/978-3-658-29924-8_7

Gessler, M., & Siemer, C. (2020). Umbrella review: Methodological review of reviews published in peer-reviewed journals with a substantial focus on vocational education and training research. *International Journal for Research in Vocational Education and Training*, *7*(1), 91–125. https://doi.org/10.13152/IJRVET.7.1.5

Gonon, P. (2014). Development cooperation in the field of vocational education and training – The dual system as a global role model? In M. Maurer & P. Gonon (Eds.), *The challenges of policy transfer in vocational skills development* (pp. 241–260). Peter Lang AG.

Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information and Librairies Journal*, *26*(2), 91–108. https://doi.org/10.1111/j.1471-1842.2009.00848.x

Gräsel, C. (2010). Stichwort: Transfer und Transferforschung im Bildungsbereich. *Zeitschrift für Erziehungswissenschaften*, *13*(7), 7–20. https://doi.org/10.1007/s11618-010-0109-8

Haering, B., Rageth, L., Rageth, G., & Pohl, N. (2014). *Pilot project Swiss VET Initiative India: Cooperation between Switzerland and India in the field of vocational education and training 2009-2013; Evaluation*. Econcept.

Hartig, J. (2008). Kompetenzen als Ergebnisse von Bildungsprozessen. In N. Jude, J. Hartig & E. Klieme (Eds.), *Bildungsforschung Band 26. Kompetenzerfassung in pädagogischen Handlungsfeldern. Theorien, Konzepte und Methoden* (pp. 15–25).

Haßler, B. et al. (2019). *Berufsbildung in Subsahara-Afrika: Eine systematische Aufarbeitung des Forschungsstandes*. BIBB.

Hildenbrand, B. (1991). Fallrekonstruktive Forschung. In U. Flick (Ed.), *Handbuch qualitative Sozialforschung: Grundlagen, Konzepte, Methoden und Anwendungen* (pp. 256–260). Beltz Verlag.

Holle, L. (2019), *Personalstrategische Maßnahmen von deutschen Unternehmen in China: Eine Fallstudie am Beispiel mittelständischer Unternehmen*. Internationale Berufsbildungsforschung. Springer VS.

Hummelsheim, S., & Baur, M. (2014). The German dual system of initial vocational education and training and its potential for transfer to Asia. *Prospects*, *44*(2), 279–296. http://dx.doi.org/10.1007/s11125-014-9311-4

Jonda, I. (2012). Ideen für ein mögliches Geschäftsmodell: Duale Berufsbildung als Export. *Wirtschaft und Beruf*, (1), 22–27.

Jude, N., & Klieme, E. (2008). Einleitung. In N. Jude, J. Hartig & E. Klieme (Eds.), *Bildungsforschung Band 26. Kompetenzerfassung in pädagogischen Handlungsfeldern. Theorien, Konzepte und Methoden* (pp. 10–14).

Jules, T. D. (2015). Educational exceptionalism in small (and micro) states: Cooperative educational transfer and TVET. *Research in Comparative & International Education*, *10*(2), 202–222. https://doi.org/10.1177%2F1745499915571706

Kelle, U., & Kluge, S. (2010). *Vom Einzelfall zum Typus: Fallvergleich und Kontrastierung in der qualitativen Sozialforschung*. Springer VS.

Kenzhegaliyeva, M. (2018). German Dual System: A Model for Kazakhstan? *Education in Modern Society*, *16*, 80–84. https://files.eric.ed.gov/fulltext/ED586132.pdf

Kitchenham, B., & Charters, S. (2007). *Guidelines for Performing Systematic Literature Reviews in Software Engineering*. University of Durham.

Klatt, F. (2019). *Systematic literature review*. https://www.dbwm.tu-berlin.de/menue/fuer_forschende_lehrende/methode_systematic_literature_review/

Klieme, E., & Hartig, J. (2007). Kompetenzkonzepte in den Sozialwissenschaften und im erziehungswissenschaftlichen Diskurs. Kompetenzdiagnostik. *Zeitschrift für Erziehungswissenschaft, Beiheft 8,* 11–29. Springer VS. https://doi.org/10.1007/978-3-531-90865-6_2

Körbel, M., Pierenkemper, S., & Zibrowius, M. (2017). *Fachkräftesicherung deutscher Unternehmen im Ausland – Erfahrungen bei der Übertragung dualer Ausbildungselemente: Abschlussbericht*. Institut der deutschen Wirtschaft Köln.

Krekel, E. M., & Walden, G. (2016). Exportschlager Duales System der Berufsbildung? In L. Bellmann & G. Grözinger (Eds.), *Ökonomie und Gesellschaft* (pp. 55–70). Metropolis Verlag.

Krzywdzinski, M., & Jürgens, U. (2019). Transfer deutscher und japanischer Ansätze der Facharbeiterausbildung an die BRIC-Standorte: Volkswagen und Toyota im Vergleich. In M. Gessler, M. Fuchs & M. Pilz (Eds.), *Konzepte und Wirkungen des Transfers Dualer Berufsausbildung* (pp. 281–319). Springer VS. https://doi.org/10.1007/978-3-658-23185-9_8

Kuper, H., & Schrader, J. (2013). Stichwort: Weiterbildung im Spiegel empirischer Bildungsforschung. *Zeitschrift für Erziehungswissenschaft, 16*(1), 7–28. http://dx.doi.org/10.1007/s11618-013-0347-7

Lahiff, A., Li, J., Unwin, L., Zenner-Höffkes, L., & Pilz, M. (2019). Industrial standardisation as a driver for cross-national convergence in training processes - Aviation apprenticeships in England and Germany. *European Journal of Training and Development, 43*(7/8), 752–766. https://doi.org/10.1108/ejtd-11-2018-0112

Lange, M., & Hohnwald, J. (2008). *Die deutsche duale Berufsausbildung im deutschen Auslandsschulwesen: Bestandaufnahme, Transferproblematik und interkulturelle Qualifizierungsaspekte*. BIS Verlag.

Langthaler, M. (2017). *Policy Transfer im Bildungswesen mit einem Fokus auf den Transfer des dualen Lehrlingssystem im Rahmen der Entwicklungszusammenarbeit* (Briefing Paper No. 15). Austrian Foundation for Development Research. http://hdl.handle.net/10419/171333

Le Deist, F. D., & Winterton, J. (2005) What Is Competence? *Human Resource Development International*, *8*(1), 27–46. https://doi.org/10.1080/1367886042000338227

Li, J. (2017). *Policy-Transfer von deutschen Evaluationskonzepten der Berufsbildung in China: Eine Analyse am Beispiel des Peer-Review-Verfahrens*. Springer VS.

Li, J. (2019). Vom Transfer lernen: Potenzial des Policy-Transfers für die Weiterentwicklung der Policy im Geberland am Beispiel des Peer-Review-Verfahrens. In M. Gessler, M. Fuchs & M. Pilz (Eds.),

Konzepte und Wirkungen des Transfers Dualer Berufsausbildung (pp. 601–630). Springer VS. https://doi.org/10.1007/978-3-658-23185-9_16

Li, J., & Pilz, M. (2019). Transferring German evaluation policy to China: A prospective evaluation of peer review in TVET. *Comparative Education Review*, *63*(4), 613–632. https://doi.org/10.1086/705425

Li, J., & Pilz, M. (2021). International transfer of vocational education and training: A literature review. *Journal of Vocational Education & Training*. Advance online publication. https://doi.org/10.1080/13636820.2020.1847566

Meyser, J. (2014). Technologietransfer und berufliche Bildung. In S. Wolf & J. Meyser (Eds.), *Berufsbildungstransfer nach Ägypten* (pp. 290–307). Universitätsverlag der TU Berlin. http://dx.doi.org/10.14279/depositonce-4149

Mulder, M., Weigel, T., & Collins, K. (2007). The Concept of competence in the development of vocational education and training in selected EU member states: A critical analysis. *Journal of Vocational Education & Training*, *59*, 67–88. https://doi.org/10.1080/13636820601145630

Oakley, A. (2017). Foreword. In D. Gough, S. Oliver & J. Thomas (Eds.), *An introduction to systematic reviews* (pp. 13–16). Sage.

Peters, S. (2019a). Betrieblicher Transfer beruflicher Bildung: Fallbeispiel Südafrika. In M. Gessler, M. Fuchs & M. Pilz (Eds.), *Konzepte und Wirkungen des Transfers Dualer Berufsausbildung* (pp. 312–359). Springer VS.

Peters, S. (2019b). *Bildungstransfer im Unternehmenskontext*. Springer VS. https://doi.org/10.1007/978-3-658-25819-1

Pfaffe, P. (2019). *Trendbarometer Exportbranche Aus- und Weiterbildung 2019*. Bundesinstitut für Berufsbildung.

Phillips, D., & Ochs, K. (2003). Processes of policy borrowing in education: Some explanatory and analytical devices. *Comparative Education, 39*(4), 451–461. https://doi.org/10.1080/0305006032000162020

Pilz, M., & Li, J. (2014). Tracing teutonic footprints in VET around the world? *European Journal of Training and Development, 38*(8), 745–763. https://doi.org/10.1108/EJTD-10-2013-0110

Pilz, M. (2016). Training patterns of German companies in India, China, Japan and the USA: What really works? *International Journal for Research in Vocational Education and Training*, *3*(2), 66–87. http://dx.doi.org/10.13152/IJRVET.3.2.1

Pilz, M. (2017). Policy borrowing in vocational education and training (VET) – VET system typologies and the "6 P Strategy" for transfer analysis. In M. Pilz (Ed.), *Vocational education and training in times of economic crisis: Lessons from around the world* (pp. 473–490). Springer International.

Pilz, M., & Li, J. (2019). 'Yes we can' oder 'Born in the USA?' Ausbildungsstrategien deutscher Unternehmen in den USA. In M. Pilz, K. Breunig & S. Schumann (Eds.), *Berufsbildung zwischen Tradition und Moderne: Festschrift für Thomas Deißinger zum 60. Geburtstag* (pp. 331–346). Springer VS. http://dx.doi.org/10.1007/978-3-658-24460-6_20

Powell, J. J. W., Graf, L., Bernhard, N., Coutrot, L., & Kieffer, A. (2012). The shifting relationship between vocational and higher education in France and Germany: towards convergence? *European Journal of Education*, *47*(3), 405–423.

Ramasamy, M. (2020). Competency-based curriculum development in vocational education and training: An example of knowledge transfer from the Western world to India. In M. Pilz & J. Li (Eds.), *Comparative vocational education research. Internationale Berufsbildungsforschung* (pp. 181–198). Springer VS. https://doi.org/10.1007/978-3-658-29924-8_11

Ramasamy, M., & Pilz, M. (2019). Competency-based curriculum development in the informal sector: The case of sewing skills training in rural South India. *International Review of Education*, *65*, 905–928. https://doi.org/10.1007/s11159-019-09810-4

Rappleye, J. (2006). Theorizing educational transfer: Toward a conceptual map of the context of cross-national attraction. *Research in Comparative and International Education*, *1*(3), 223–240. https://doi.org/10.2304%2Frcie.2006.1.3.223

Ritschl, V., Stamm, T., & Unterhumer, G. (2016). Wissenschaft praktisch – evidenzbasierte Praxis. In V. Ritschl, R. Weigl & T. Stamm (Eds.), *Wissenschaftliches Arbeiten und Schreiben: Verstehen, Anwenden, Nutzen für die Praxis* (pp. 291–306). Springer. https://doi.org/10.1007/978-3-662-49908-5

Rowley, J. (2002). Using case studies in research. *Management Research News*, *25*(1), 16–27. http://dx.doi.org/10.1108/01409170210782990

Schröder, T. (2019). Regional Association for Vocational and Technical Education in Asia (RAVTE): Eine regionale Struktur zur Verbreitung von Berufsbildungsansätzen und Berufsbildungsforschung als Entwicklungsbeitrag in der ASEAN-Region. In *Konzepte und Wirkungen des Transfers Dualer Berufsausbildung* (pp. 437–461). Springer VS. https://doi.org/10.1007/978-3-658-23185-9_12

Shavelson, R. J. (2013). On an approach to testing and modeling competence. *Educational Psychologist*, *48*(2), 73–86. https://psycnet.apa.org/doi/10.1080/00461520.2013.779483

Seeber, S., & Seifried, J. (2019). Herausforderungen und Entwicklungsperspektiven der beruflichen Bildung unter veränderten Rahmenbedingungen. *Zeitschrift für Erziehungswissenschaft*, *22*, 485–508. https://doi.org/10.1007/s11618-019-00876-2

Simons, H. (2009). *Case study research in practice*. SAGE Publications. https://dx.doi.org/10.4135/9781446268322

Stockmann, R. (2013). *Metaevaluierung der Berufsbildung: Ziele, Wirkungen und Erfolgsfaktoren der deutschen Berufsbildungszusammenarbeit*. Waxmann.

Stockmann, R. (2019). Ziele, Wirkungen und Erfolgsfaktoren der deutschen Berufsbildungszusammenarbeit. In M. Gessler, M. Fuchs & M. Pilz (Eds.), *Konzepte und Wirkungen des Transfers Dualer Berufsausbildung* (pp. 121–162). Springer VS. https://doi.org/10.1007/978-3-658-23185-9_4

Stockmann, R., & Silvestrini, S. (2013). Erwartungen, Hoffnungen und Ergebnisse zur Nachhaltigkeit der deutschen staatlichen Berufsbildungsförderung. *Zeitschrift für Berufs- und Wirtschaftspädagogik*, *109*, 170–190.

Strittmatter, J., & Böhner, M. (2019). Deutsche Berufsbildung in Partnerländern erfolgreich gestalten: Ein praxisorientierter Ansatz für bilaterale Transferprozesse. In M. Gessler, M. Fuchs & M. Pilz (Eds.), *Konzepte und Wirkungen des Transfers Dualer Berufsausbildung* (pp. 515–548). Springer VS. https://doi.org/10.1007/978-3-658-23185-9_14

Stuart, J. D. (2013). *Investigating Policy Transfer from Both Sides: Case Study of a Technical and Vocational Education and Training Model in South Africa*. ProQuest LLC. https://hdl.handle.net/11299/161097

Sturma, A., Ritschl, V., Dennhardt, S., & Stamm, T. (2016). Reviews. In V. Ritschl, R. Weigl & T. Stamm (Eds.), *Wissenschaftliches Arbeiten und Schreiben: Verstehen, Anwenden, Nutzen für die Praxis* (pp. 207–220). Springer.

Tanaka, M. (2005). *The Cross-cultural transfer of educational concepts and practices: A comparative study.* Cambridge University Press.

Tonhäuser, C., & Büker, L. (2016). Determinants of transfer of training: A comprehensive literature review. I*nternational Journal for Research in Vocational Education and Training*, *3*(2), 127–165. https://doi.org/10.13152/IJRVET.3.2.4

Valiente, O., López-Fogués, A., Fuentes, H., & Rosado, R. (2020). Evaluating dual apprenticeship effects on youth employment: A focus on the mechanisms. In *Comparative Vocational Education Research* (pp. 163–180). Springer VS. https://doi.org/10.1007/978-3-658-29924-8_10

Van der Burgt, J., Li, J., Wilbertz, C., & Pilz, M. (2014). Qualifizierungsstrategien deutscher Unternehmen in Japan, Indien und China – Deutsche Vorbilder oder ein einheimisches Verfahren? *Zeitschrift für Erziehungswissenschaften*, *17*, 135–158. https://doi.org/10.1007/s11618-014-0480-y

Vogelsang, B., & Pilz, M. (2020). Conditional factors for training activities in Chinese, Indian and Mexican subsidiaries of German companies. *European Journal of Training and Development*. Emerald Publishing Limited. https://doi.org/10.1108/EJTD-04-2020-0066

Waddington, H., White, H. T., & Tugwell, P. (2012). How to do a good systematic review of effects in international development: A tool kit. *Journal of Development Effectiveness*, *4*(3), 359–387. https://doi.org/10.1080/19439342.2012.711765

Welfens, N. (2016). Transfer durch Krise? – Frankreichs Berufsbildungssystem zwischen Pfadabhängigkeit und deutschem Modell. In J. Schmid, K. Amos, J. Schrader & A. Thiel (Eds.), *Internationalisierte Welten der Bildung: Bildung und Bildungspolitik im globalen Vergleich* (pp. 97–117). Nomos.

Wiemann, K. (2020). Qualifizierungspraxis deutscher Produktionsunternehmen in China, Indien und Mexiko: Eine Analyse der Übertragbarkeit dualer Ausbildungsansätze. Springer VS.

Wiemann, K., Li, J., Wiemann, J., Fuchs, M., & Pilz, M. (2019). 'Lost (in) VET': Zum Stand der Transferforschung in der internationalen Berufsbildungszusammenarbeit aus Sicht verschiedener Wissenschaftsdisziplinen. In M. Gessler, M. Fuchs & M. Pilz (Eds.), *Konzepte und Wirkungen des Transfers Dualer Berufsausbildung* (pp. 13–57). Springer VS.

Wiemann, K., & Pilz, M. (2019). Welche Faktoren beeinflussen die Übertragung dualer Ausbildungsansätze ins Ausland? *Zeitschrift für Berufs- und Wirtschaftspädagogik*, *115*(3), 420–446. https://doi.org/10.25162/zbw-2019-0018

Wiemann, K., & Pilz, M. (2020). Transfer research as an element of comparative vocational education and training: An example of factors influencing the transfer of dual training approaches of German companies in China, India and Mexico. In M. Pilz & J. Li (Eds.), *Comparative vocational education research. Internationale Berufsbildungsforschung* (pp. 199–219). Springer VS. http://dx.doi.org/10.1007/978-3-658-29924-8_12

Wolf, S. (2013). Berufsbildung in einer jungen Gesellschaft im Aufbruch – Arbeitskultur und der Transfer deutscher Ausbildung in die ägyptische Bauindustrie. In *bwp@ Spezial 6 – Hochschultage Berufliche Bildung 2013, Fachtagung 03*, 1–16. http://www.bwpat.de/ht2013/ft03/wolf_ft03-ht2013.pdf

Wolf, S. (2017). International technical and vocational education and training (TVET) transfer project – Theoretical-practical experiences of workplace training with the workforce in the Egyptian construction industry. In M. Pilz (Ed.), *Vocational education and training in times of economic crisis: Lessons from around the world* (pp. 439¬–460). Springer. http://dx.doi.org/10.1007/978-3-319-47856-2_24

Xiao, Y., & Watson, M. (2017). Guidance on conducting a systematic literature review. *Journal of Planning Education and Research*, *39*(1), 1–20. https://doi.org/10.1177%2F0739456X17723971

Yin, R. K. (2009). *Case study research: Design and methods*. SAGE Publications.

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Appendix

Table 4: Overview of the Included Studies

No	Aim of the Study	Method	Sample	Countries Involved	Reference
Theoretical-conceptual					
1	Identifying key processes related to the transfer of core elements of the German dual training system to the SENATI training program	Document analysis	Documents and studies of SENATI; Comprehensive documentation of the vocational education and training cooperation (1998-2003)	Germany, Peru	Angles & Lindemann (2019)
2	Investigating the policy transfer process in the context of vocational training cooperation in three countries	Analysis of the VET policy transfer process		Germany, Egypt, Malaysia, Korea	Barabasch & Wolf (2010)
3	Further developing and applying a theoretical model for the analysis of the policy transfer process using three examples	Document analysis of gray and scientific literature; filtering for relevant topics using "indexing" method		Germany, China, Turkey	Barabasch & Wolf (2011)
4	Examining how CARICOM members relied upon the policy tool of 'cooperative educational transfer' at the regional level; Analyzing how authoritative action in the movement of policy ideas is undertaken across national educational policies	Case study: Summative content analysis of policy discourse	Educational policies of 13 CARICOM members	Caribbean Community (CARICOM)	Jules (2015)
5	Answering fundamental questions related to the transfer of German vocational training in the context of the project "WEB-TT" in Egypt	Practice-oriented analysis (demand pull and technology push)	3 inter-company training centers for the construction industry; further partners: Factories construction industry in Egypt	Germany, Egypt	Meyser (2014)
6	Presenting lessons learned from the experiences, results and successes of the work performed by the "Regional Association for Technical and Vocational Education" (RAVTE) in the ASEAN region; perspectives for the use and development of regional structures for VET research, systems, and cooperation	Descriptive report	27 member universities from 8 countries in the ASEAN region	Asian countries (ASEAN countries)	Schröder (2019)

No	Aim of the Study	Method	Sample	Countries Involved	Reference
Empirical					
7	Examining the effectiveness of dual vocational education in the U.S. through an analysis of case studies with a focus on their strengths and weaknesses	Case study based on literature review; interviews with various parties; site visits	Various participants in apprenticeship training at BMW, Siemens, and VW in the USA	Germany, USA	Aring (2014)
8	Describing and reflecting on practical experiences regarding the feasibility of transferring the dual apprenticeship system to other countries	Observation; author acted as an external advisor or representative of the donor agency	Apprentices from: Nicaragua/the Phillippines (small and micro-enterprises in the informal sector); Bolivia (local business associations); Burkina Faso (workshop/ workplace of the master)	Nicaragua, Bolivia, the Philippines, Burkina Faso, Switzerland	Batliner (2014)
9	Identifying key success factors that are necessary for the successful and sustainable establishment of dual vocational training	Interviews; content analysis	Representatives of training companies and potential training companies as part of the SMART NET project	Austria, Germany, Switzerland, Slovakia	Bliem et al. (2014)
10	Investigating whether policy transfer can reduce structurally induced unemployment	Case study	Greek hospitality industry: 2 locations, i. e. Athens and Heraklion, 170 apprentices in 35 training companies	Germany, Greece	Bohlinger & Wolf (2016)
11	Investigating how partnerships have been developed between three major industry sectors and schools at a systemic level	Semi-structured interviews	50 school and industry members, e.g. school principals and teachers, workplace and school coordinators, or industry project officers	Australia	Flynn et al. (2015)
12	Analyzing how multinational companies (MNCs) implement dual training structures in the U.S.	Qualitative case study; interviews	Apprenticeship Network: network of 8 companies partnering with local community college, the State Department of Labor and High Schools n = 14 interviews and 167 documents	Germany, Austria, Switzerland, USA	Fortwengel & Jackson (2016)
13	Identifying and presenting driving and inhibiting factors in the export of German vocational training services	Interviews	14 collaborative projects (49 subprojects) as basis interviews with 39 subprojects participated 3 regionally oriented focus group meetings with the collaborative partners	Germany	Fraunhofer MOEZ (2012)

No	Aim of the Study	Method	Sample	Countries Involved	Reference
14	Examining the strategies of multinational companies (MNCs) for transferring strategies used in German vocational education and training to the international level	Expert interviews	Experts: Subsidiary managers, human resource executives, training managers Germany: n=15; Mexico: n=105; India: n=67; China: n=73	Germany, Mexico, India, China	Fuchs (2020)
15	Analyzing the transfer of competency-based education and training (CBET) to Namibia	Case study; analysis of registered unit standards in terms of level and credits provided by the NQA	Analyzing the registered unit standards of the National Qualifications Framework (NQF): (n = 1,277)	England (Germany), Namibia	Gessler & Peters (2020)
16	Investigating a vocational training transfer from a German company to a plant in the U.S.	Case study based on document analysis; expert interviews; site visits	Document: Tuscoloosa News, documentation from the factory itself (DaimlerChrysler) and academic studies of the factory¸ expert interviews (n=6); site visits (n=2)	Germany, USA	Gessler (2017)
17	Investigating whether vocational training transfer from Switzerland to India is possible	Document analyses; content analysis; interviews	Explorative interviews with the main project partners (n = 8) in Switzerland (e.g. directors, founders, ministries) Interviews with project partners in India (n = 80) Interviews with additional companies and associations (n = 7)	Switzerland, Germany, India	Haering et al. (2014)
18	Examining to what extent recruitment and qualification measures are adapted to the respective country-specific conventions	Case studies; semi-structured interviews; document analysis;observation at production level	2 medium-sized companies in China (automobile, textile, and consumer goods industries: Krones Machinery (Taicang) Co., Ltd. Kern-Liebers (Taicang) Co., Ltd); interviews with: German companies (n=4), Chinese vocational schools (n=2), Chinese company (n=1), Chamber of Commerce Shanghai (n=1)	Germany, China	Holle (2019)
19	Investigating the training strategies of German companies in emerging countries and identifying obstacles and success factors	Interviews	16 German companies with a foreign location in Southeast Asia, Africa or Latin America	Germany, developing and emerging countries in Southeast Asia, Africa and Latin America	Körbel et al. (2017)

No	Aim of the Study	Method	Sample	Countries Involved	Reference
20	Identifying possibilities and limitations of vocational training transfer to BRIC countries	Case study; interviews	11 VW and Toyota factories in BRIC countries: a total of n=353 interviews conducted by parties involved at different levels	Germany, Brazil, Russia, India, China	Krzywdzinski & Jürgens (2019)
21	Examining the impact of international technical standardization and regulation on the design, organisation and delivery of apprenticeships in the aeronautical and aerospace sectors in England and Germany	Observation of apprentices in the workplace; semi-standardised interviews with apprentices, trainers and managers	Large companies with well-developed apprenticeship programs: England: n=3 companies, Germany: n=4 companies	England, Germany	Lahiff et al. (2019)
22	Investigating the extent to which a comparison between the original policy in the donor country and the transferred policy in the recipient country could be used to further develop the policy	Ex-ante evaluation; using pilot studies as examples to analyze the implementation of the VET peer review process in the two countries	3 German schools (in North Rhine-Westphalia) and 4 Chinese vocational schools (in Shanghai)	Germany, China	Li (2019)
23	Policy transfer at the institutional level: examining the extent to which there is potential to transfer the evaluation concept of peer review in TVET to China; deriving supporting and inhibiting factors from the study	Participant observations; qualitative interviews	4 participating TVET schools providing teaching in administration, health care, and the craft sector; evaluation of peer teams comprising 4 members: the coordinator, the deputy coordinator, and one peer for each of the subject areas selected by the school	Germany, China	Li & Pilz (2019)
24	Obtaining information on the entire education and training landscape in Germany and using this information to gain important pointers for successful foreign business in the future	Interviews	164 education and training providers involved in education exports	Germany	Pfaffe (2019)
25	Investigating an education transfer within a company (Mercedes-Benz) and how success criteria can be defined and assessed in the context of international educational transfer	Case study; document analyses; semi-structured expert interviews; site inspections	Document analyses, expert interviews (n = 10), site visits (n = 3) Mercedes-Benz (MBSA plant in Germany, USA and South-Aftrica)	Germany, USA, South Africa	Peters (2019a); see also Peters (2019b)

No	Aim of the Study	Method	Sample	Countries Involved	Reference
26	Investigating the training practices of German companies in the USA, China, India and Japan, focusing on initial training	Semi-structured exploratory expert interviews	Training experts as company representatives USA: n=10 China: n=11 India: n=15 Japan: n=5	Germany, China, USA, India, Japan	Pilz (2016)
27	Investigating the training strategies of German companies in the U.S. with regard to their convergence or divergence from strategies used in the U.S.	Expert interviews	Representatives of German companies in the U.S. (n=10)	Germany, USA	Pilz & Li (2019)
28	Analyzing the vocational and training behaviors of German corporations at their subsidiaries in the USA, China and India	Semi-structured exploratory expert interviews	Training experts as company representatives USA: n=10 China: n=11 India: n=15	Germany, China, USA, India	Pilz & Li (2014)
29	Analyzing the importance of the curriculum design and teaching-learning arrangements at the micro level in the curriculum development process from a comparative VET perspective	Qualitative semi-structured interviews; group discussions	11 focus group discussions and 15 one-to-one interviews in the villages with project partners at the local level; Expert interviews with 4 different categories of experts: Vocational training institutes (n=2); vocational training providers (n=2); garment indstry (n=1); self-employed (n=1)	Western countries, India	Ramasamy (2020)
30	Transfer of a competency-based approach to rural Indian sewing courses; examined to what extent a competency-based sewing skills curriculum is beneficial for vocational skills development of (female) learners in rural areas	Group and individual interviews; questionnaire; pilot study of newly developed curriculum: 8-week courses in all 4 villages; evaluation	Pilot study - Phase 1: 4 villages in 2 rural areas in the state of Tamil Nadu in South India; Phase 2: 10 experts about individual sewing skills to explore curriculum framing and teaching–learning arrangements from a pedagogical perspective	(South) India	Ramasamy & Pilz (2019)

31	Investigating the transfer of a specific training system, the Manufacturing (M) Powered program, from Minnesota in the United States to South Africa; describing which features were important in the successful transfer of M-Powered to TDM-Powered	Case study: Questionnaires, interviews, documents	Stakeholders who undertook to transfer M-Powered over to South Africa: 6 from USA, 8 from South Africa, 1 South African expatriate living in Minnesota	USA, South Africa	Stuart (2013)
32	Analyzing the qualification practice of German companies in their foreign locations in Japan, India and China	Expert interviews	Interviews with decision-makers (e.g. HR managers, training managers) for the area of education and training in German companies in Japan, India, and China In Japan: 5 interviews In India: 15 interviews In China: 11 interviews	Germany, Japan, India, China	Van der Burgt et al. (2014)
33	Examining the effectiveness of the German model of dual apprenticeships when transferred to different national settings	Evaluation approach; interviews	Mexican Model of Dual Apprenticeships (MMFD): n = 32 2 phone interviews with apprentices who had graduated from the programme in 2015/16 (1 structured survey and 1 semi-structured interview)	Germany, Mexico	Valiente et al. (2020)
34	Investigating the transfer of dual initial training practices and further training measures in German multi-national companies	Expert interviews	46 training managers in 12 active companies in all 3 countries	Germany, China, India, Mexico	Vogelsang & Pilz (2020)
35	Investigating the extent to which German manufacturing companies have transferred the dual vocational training model to three countries and which influencing variables affect this possible transfer	Qualitative analysis; expert interviews	Interviews with 149 training experts and managers of the human resources departments of subsidiaries of German production companiens; 86 companies in China, India and Mexico and responsible persons in public and private vocational training institutions	Germany, China, India and Mexico	Wiemann & Pilz (2019)

36	Describing and analyzing the educational transfer project with a private company WEB-TT in Egypt and the "Train-the-Trainer Made in Germany" interventions to investigate employment qualification in the Egyptian construction industry	Observations on construction sites; interviews with experts; evaluation of literature using methods of qualitative social and vocational training research; design and implementation of training activities	Interviews with managers and engineers of the construction company; expert-interviews with construction engineers from German companies; discussions with local engineers and managers to understand the structure and regulations of Egyptian construction work	Germany, Egypt	Wolf (2013); see also Wolf (2017)

No	Aim of the Study	Method	Sample	Countries Involved	Reference
Meta-analytical					
37	Analyzing the existing literature on VET reform implementation for key determinants, trends, and gaps using a determinant framework and synthesizing the available evidence on reform implementation in VET to summarize the work in this field	Systematic literature review of reports and studies accessible in electronic research databases on VET and general education, academic databases on related topics, or international organisations doing VET research	Literature review of 1,835 sources, coding 177 for 1,538 data points (including publications from 1984 - 2017). Of the 177 coded sources, 62 are peer-reviewed literature, and 115 are non-peer-reviewed sources including 49 books and 66 others (e.g. policy reports)	Europe, Asia, Africa	Caves et al. (2019)
38	Analyzing the constitutive elements of the German dual system and their (re-)design when transferred to other countries	Literature analysis of the relevant legal sources	Reflection of transfer examples from Switzerland, Austria, Netherlands, Denmark, Norway, Luxembourg, England	Germany	Euler (2013)
39	Analyzing the question to what extent dual vocational training can be exported and examining the future of dual vocational training in German-speaking countries	Meta-analysis of the current state of research on transfer (elements) of apprenticeship models		German-speaking countries with dual vocational training system	Gonon (2014)
40	Investigating how Germany, as a transferor, can transfer elements of the dual system to Asian countries	Meta-analysis; descriptive analysis	14 GIZ VET projects in 10 Asian countries: Afghanistan, China, East Timor, Indonesia, Laos, Mongolia, Myanmar, Pakistan, Sri Lanka, and Vietnam	Germany, various Asian countries	Hummelsheim & Baur (2014)
41	Developing a key variable model of central success factors for sustainable vocational training projects	Meta-evaluation	Vocational training projects between 1997 and 2010	Germany, Latin America, China	Stockmann (2019)

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Scoping Review on Research at the Boundary Between Learning and Working: A Bibliometric Mapping Analysis of the Last Decade

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Abstract

Context: The research field at the boundary between learning and working is multidimensional, fuzzy, dynamic, and characterized by high growth. A study that comprehensively maps and aggregates this research field is missing.

Approach: Using tools of bibliometric analysis (bibliographic coupling, co-citation analysis and co-occurrence analysis), we map the research at the boundary between learning and working in a scoping review study. Our study considers peer-reviewed articles published between 2011 and 2020 and recorded in Scopus. In total, 5,474 articles are included in our analysis.

Findings: Focusing on the intellectual structure of the research field, we identified the most publishing and most cited countries, journals, and authors, as well as latent collaborative networks among countries, journals, and authors. Furthermore, we used references and keywords to identify the conceptual structure of the research field and distinguished four types of conceptual clusters: motor clusters, highly developed and isolated clusters, emerging or declining clusters, and basic and transversal clusters.

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Conclusions: Research at the boundary between learning and working is highly parcelled out internationally. This scientific parcelling represents a disadvantage for exchanging ideas and accumulating knowledge. In addition to forming a parcelled field, a dividing line runs between centre, periphery and excluded countries and scientists. Especially scientists from developing countries and nations, economies in transition and those from post-conflict situations are excluded from the international discourse. This situation is more than just a disadvantage for the exchange of ideas and the accumulation of knowledge. Instead, there is a systematic bias in the research landscape here.

Keywords: Scoping Review, Mapping Review, Bibliometric Analysis, Work-based Learning, Workplace Learning, Technical and Vocational Education and Training, VET

1 Introduction

Vocational education and training systems and practices, unlike higher or general education, are considerably national in scope, which is why the field of vocational education and training (VET) practice and governance is highly parcelled out internationally (OECD, 2014). This has implications for research: the research field itself is broad, fuzzy, dynamic and characterised by high growth (McGrath et al., 2019). One reason for this growth and fuzziness is the multidimensionality of the interface of working and learning: Economical, political, institutional, social, and individual issues are at once affected. A second reason is that the economic-social crises of recent years have been particularly evident at this interface, which is why solutions are being sought precisely at this interface. This led to a massive increase in societal, economical, political and scientific importance of VET and VET research (Cedefop & OECD, 2021). Despite this high and growing importance, it is largely unknown how this vibrant field of research is structured intellectually and conceptually. The purpose of our study is to fill this gap to some extent by mapping and aggregating ten years of research at the boundary between learning and working, particularly in VET research.

The review type used is the *scoping review*, which is "used to map existing literature in a given field in terms of its nature, features, and volume. As such scoping reviews have also been called mapping reviews." (Peters et al., 2015, p. 141). Colquhoun et al. (2014) define a scoping or mapping review furthermore as "a form of knowledge synthesis that addresses an exploratory research question aimed at mapping key concepts, types of evidence, and gaps in research related to a defined area or field by systematically searching, selecting, and synthesizing existing knowledge" (pp. 1292–1293).

Scoping reviews are still rare in the vocational education and training research landscape (Gessler & Siemer, 2020). Nevertheless, some mapping approaches exisit: Bezerra et al. (2021) conducted a mapping of work-based learning research (period covered: no spe-

cific period, papers included N=410). Very close to this focus, Moosa and Shareefa (2020) executed a mapping of the most-cited publications on workplace learning (period covered: 1970–2019, papers included N=100). Further mapping reviews have focused on vocational education and training reform implementation (period covered: 1984–2017, papers included N=177) by Caves et al. (2021), digital technologies for situating vocational education and training (period covered: all years, papers included N=17) by Dobricki et al. (2020), transversal competences (period covered: 2010–2019, papers included N=34) by Calero López and Rodríguez-López (2020), Nordic research on educational and vocational guidance (period covered: 2003-2016, papers included N=290) by Haug et al. (2019), collaborative technologies for initial vocational education (period covered: all years, papers included N=26) by Schwendimann et al. (2018) and transfer of training (period covered: 1990–2015, papers included N=79) by Tonhäuser and Büker (2016).

The mentioned scoping reviews capture a specific aspect of research at the boundary between working and learning with either smaller (N=17, 26, 34, 79) or larger units of analysis (N=100, 177, 290, 410). To date, no study has attempted to map the entire field of vocational education and training research internationally. Such approaches inevitably lead to studies encompassing a large number of publications.

Using tools for bibliometric analysis, we mapped the research field at the boundary between learning and working in a scoping review study. The scoping review provides the methodological framework, ranging from database selection, article collection, analysis (here: using bibliometric analysis), interpretation, and conclusion. Another name for this type of research, which is a combination of scoping review and bibliometric analysis, is science mapping: The aim of sience mapping is to build bibliometric network and/or cluster maps which help to describe how a particular field of research is intellectually and conceptually structured (Cobo et al., 2011a.). Our first research question is therefore: How is the research field intellectually structured? To determine the intellectual structure, we analyse latent networks of countries, journals, and authors. Our second research question is: How is the research field conceptually structured? To determine the conceptual structure, we analyse the density and centrality of clustered references and keywords. We apply both research questions to research published between 2011 and 2020.

2 Data Selection and Data Analysis

This study uses bibliometric analysis, a technique that is increasingly being used as a tool and basis for monitoring the research content and performance within scientific disciplines (Zupic & Čater, 2015). The purpose of bibliometric mapping is "to provide an overview of the structure of the scientific literature in a certain domain" (van Eck, 2011, p. 1). We performed

a bibliometric field analysis to discover the intellectual structure and a bibliometric concept analysis to discover the conceptual structure of the field:

(1) The *bibliometric field analysis* was conducted to identify the most productive and most cited countries, journals and authors and their relatedness. Using the software VOSViewer (van Eck & Waltman, 2010), we first executed the descriptive analysis, followed by a network analysis based on bibliographic coupling and co-citation analysis. Finally, we clustered the units of analysis (countries, journals, authors).

(2) The *bibliometric concept analysis* was performed to identify the most cited references and the most commonly used keywords and their relatedness. Using the software SciMAT (Cobo et al., 2011b; Cobo et al., 2012a?), we first conducted a descriptive analysis, then a strategic map analysis based on a co-occurrence analysis, and finally clustered the units of analysis (references and keywords).

In the first step, we will describe the process of *data selection*, then the *data analysis* with the software (VOSViewer and SciMAT) and the bibliometric methods used (bibliographic coupling, co-citation analysis and co-occurrence analysis).

2.1 Data Selection

Data Source

Major databases for bibliometric analysis are Google Scholar (free access), Scopus (paid access, curated by Elsevier) and Web of Science Core Collection (paid access, curated by Clarivate). For the analyses in this paper, we relayed on Scopus, because Google Scholar "simply crawls any information that is available" (Harzing & Alakangas, 2016, p. 802). Google Scholar lacks quality control. On the other hand, Scopus is curated, has a fine-grade classification of document types, and the metadata for our analyses are available in good quality (Visser et al., 2021). Compared with the Web of Science Core Collection (WoS), Scopus has more comprehensive coverage, especially in Social Sciences (Martín-Martín et al., 2021). Overall, Scopus is better suited for our analysis than WoS.

Search Terms

The terms *vocational education and training* (VET) and *technical and vocational education and training* (TVET) are widely used internationally; nevertheless, the multidimensionality of the interface mentioned at the beginning require an expansion of the search term. In this study, we used the following terms to scan the title and the keywords: *Vocational education, vocational training, VET (and excluded veterin*), TVET, work-based learning,*

workplace learning, apprentice, skill formation, further education, further training, industrial education, industrial training, technical education and technical training.*

Delimitation of the search area

The search was limited to the document-type *article* and *review* and the period from 2011 to 2020. Another limitation was the subject area, which was restricted to the social sciences. Publications without country information of the author were excluded, and the source type was limited to journals, as these are the most widely noticed and therefore most accurately reflect the state of knowledge. The publication stage (final and in press) and the language (e.g., English, Spanish, French, German) were not restricted. The last search update took place on June 5, 2021. Delayed 2020 articles added to Scopus after that date were not included.

Eligibility and Appraisal

One strength of scoping reviews is that they can provide an overview of a research topic or area. Our study considers peer-reviewed articles published between 2011 and 2020 and recorded in Scopus. In total, 5,474 articles are included in our analysis. However, scoping reviews also have weaknesses. A central one is that scoping reviews "do not, for example, assess the quality of the evidence in primary research reports in any formal sense" (Arksey & O´Malley, 2005, p. 30). For this reason, the data source used (here: a curated database, Scopus, containing only peer-reviewed articles) is particularly important. As we relayed on papers published in peer-revied journals, recorded in Scoupus, we did no further quality-related check of the content of the papers. All identified studies from the field of social sciences that matched the search terms were included in our analysis without further quality control.

2.2 Data Analysis

In a comparative analysis of nine bibliometric software tools (Bibexcel, CiteSpace, CoPalRed, IN-SPIRE, Leydesdorff's Software, NetworkWorkbench Tool, Science of Science [Sci2 –Tool] VantagePoint and VOSViewer) the developers of SciMAT found that "not all the software tools are able to extract all the bibliometric networks, and, so, different tools have to be used to analyze a field from different perspectives" (Cobo et al., 2011a, p. 1400). We used two bibliometric software tools: VOSViewer and SciMAT. The strengths of VOSViewer lie in the visualisation of clusted networks (here: networks of countries, journals, and authors). Whereas we used SciMAT for the concept analysis (here: references and keywords). First, we will present the software then the techniques used for the extraction of data from the data corpus.

2.2.1 VOSViewer and SciMAT

VOSViewer is a software tool for constructing and visualising bibliometric networks. The strengths of VOSViewer lie in the visualisation of clusted networks. The software is the result of the PhD project of van Eck (2011), in collaboration with Waltman (van Eck & Waltman, 2007) at the Erasmus University of Rotterdam, the Netherlands.

Calculation of the relatedness of objects: The analysis starts in VOSViewer with the production of a data matrix based on bibliographic coupling, co-citations or co-occurrences. *Normalisation of the relatedness scores*: This data matrix is normalised in a second step to yield a similarity matrix. To calculate the similarity of the two items, the association strengths technique is used. In direct comparison, the probabilistic measures of the association strengths technique exhibit better normalisation than the set-theoretic measures of, for instance, the Jaccard index (van Eck & Waltman, 2009).

After construction of the data matrix, the network is visualised by means of, first, VOS mapping technique and, second, VOS clustering technique. In a comparison of the VOS mapping technique with more familiar multidimensional scaling (MDS), the authors found that MDS is prone to circularity, whereas VOS does not have this problem. "We have found that maps constructed using the VOS approach provide a more satisfactory representation of the underlying data set than maps constructed using either of the MDS approaches" (van Eck et al., 2010, p. 16).

Nodes (and their relations) in a map can be either graph-based or distance-based in terms of how they are visualised. "Distance-based maps are maps in which the distance between two items reflects the strength of the relation between the items. A smaller distance generally indicates a stronger relation" (van Eck & Waltman, 2010, p. 525). For graph-based maps, the criterion for visualisation is not distance or proximity to show the strength of relationships but aesthetically pleasing graphs, which is why unlimited iterations are possible in approximating the visual optimum (e.g., Fruchterman & Reingold, 1991). In short, distance-based representations are more informative than graph-based maps. VOSViewer produces *distance-based maps* and uses a mapping technique for the construction of the maps, which the authors call *visualisation of similarities* (VOS).

The VOS clustering technique can be regarded as an alternative to other clustering techniques, such as hierarchical clustering (van Eck, 2011, p. 19). Clusters can produce conflicts; for example, "having well-separated clusters of items may conflict with having distances that accurately reflect the similarity or relatedness of items" (van Eck, 2011, p. 117). Mapping and clustering can nevertheless be viewed as complementary: Mapping produces detailed maps on continuous data, while clustering produces coarse maps on binary data (Waltman et al., 2010). A cluster "is a set of closely related nodes. Each node in a network is assigned to exactly one cluster. The number of clusters is determined by a resolution parameter. The higher the value of this parameter, the larger the number of clusters" (van Eck & Waltman, 2014, p. 295).

Waltman and van Eck use an algorithm they call a *smart local moving algorithm* to detect and optimise the clusters (Waltman & van Eck, 2013).

SciMAT (Science Mapping Analysis Software Tool) was developed at the University of Grenada in Spain by Cobo, López-Herrera, Herrera-Viedma and Herrera (Cobo et al., 2012). The workflow is comparable with the described process of VOSViewer: Network extraction with a data matrix as a result, normalisation with a similarity matrix as a result, mapping combined with clustering and, finally, the visualisation. Different network extraction techniques are offered, such as co-occurrence, coupling and direct linkage, and different normalisation techniques can be used, such as association strengths, Salton's cosine and the Jaccard index. To get the map and its associated clusters, a clustering technique must be applied. The developers implemented, among other techniques, the simple center algorithm, which we used in our study for two reasons: The simple center algorithm is an accepted and often used algorithm in co-word-studies. Furthermore, "the simple centers algorithm automatically returns labelled clusters, so a post-process to label the clusters is not needed." (Cobo et al., 2011b, p. 149). The labels of the clusters in Figures 7 and 8 have their origin in the application of this algorithm.

We used SciMAT for the concept analysis. SciMAT adds another analysis step to the already described analysis process: Callon's density and centrality measures, as network measures are detected for each identified cluster (Callon et al., 1991; Cobo et al., 2012). The result of this additional analysis is a strategic map with four sectors (Figure 1).

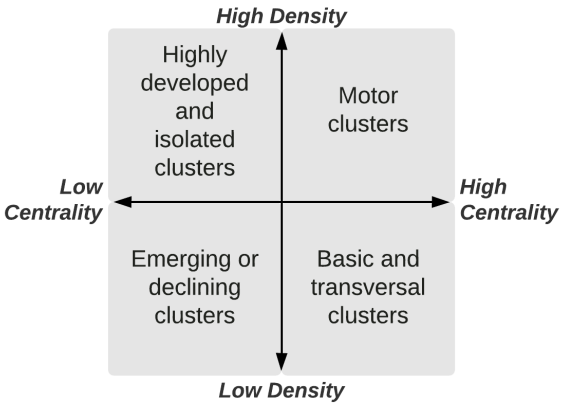


Figure 1: Strategic Map (Based on Cobo et al., 2012, p. 1618)

Themes in the quadrant *motor clusters* (top right) with high density and high centrality measures "are both well developed and important for the structure of the research field" (Cobo et al., 2018, p. 265). Themes in the quadrant of *highly developed and isolated clusters* (top left)

with high density and low centrality are highly specialised, with intense internal ties within the cluster but weak external ties with other clusters. Themes in the quadrant emerging or declining clusters (bottom left) are "both weakly developed and marginal. The themes in this quadrant have low density and low centrality and mainly represent either emerging or disappearing themes" (Cobo et al., 2018, p. 265). Themes in the *quadrant basic and transversal clusters* (bottom right) have high centrality but low density. Themes in this quadrant are important, with mainly general, basic themes.

2.2.2 Bibliographic Coupling, Co-Citation Analysis and Co-Occurrence Relations

Bibliographic coupling is "about the overlap in the reference lists of publications. The larger the number of references two publications have in common, the stronger the bibliographic coupling relation between the publications" (van Eck & Waltman, 2014, p. 287). It is defined as follows: "A single item of reference used by two papers was defined as a unit of coupling between them" (Kessler, 1963, p. 10). Therefore, if two entities (e.g. authors) share the same reference(s), they are bibliographically coupled. The strength of the link increases with the number of shared references. Another method to identify similarities between entities is via popular co-citation analysis (Figure 2). *Co-citation* "is defined as the frequency with which two documents are cited together" (Small, 1973, p. 265).

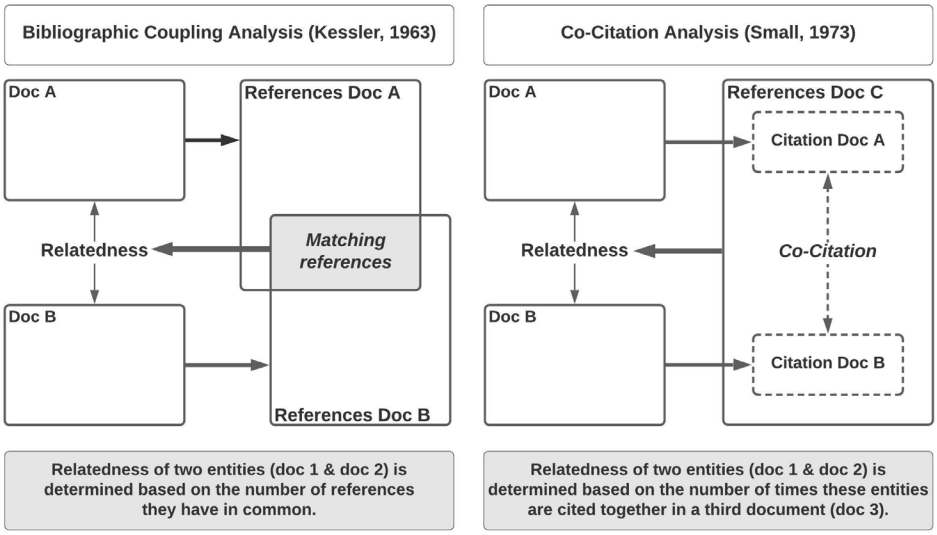


Figure 2: Comparison Between Bibliographic Coupling and Co-Citation Analysis

Co-citation analysis relies on a third document (Figure 2: Doc C) to identify links between documents. Because of this prerequisite, it is difficult to discover links between documents that have been published recently. Bibliographic coupling is, conversely, "able to cluster very recent papers" (Boyack & Klavans, 2010, p. 2391). In the search for the most accurate cluster solution of "pure citation-based approaches, bibliographic coupling gave the most accurate solution, followed closely by co-citation analysis" (Boyack & Klavans, 2010, p. 2402). Bibliographic coupling was used to identify the thematic similarities or latent collaboration between countries and journals. To identify the latent collaboration between authors by detecting the most cited authors, we used co-citation analysis. Bibliographic coupling and co-citation analysis are used to analyse the intellectual structure of the scientific research field with a focus on networks of countries, journals and authors (Cobo et al., 2011a).

A co-occurrent relation is, in contrast to bibliographic coupling and co-citation analysis, "established between two units (authors, terms, or references) when they appear together in a set of documents; that is, when they co-occur throughout the corpus" (Cobo et al., 2012, p. 1611). The more frequent the number of common occurrences or co-occurrences, the stronger the relation between the units (here: References and keywords). A third document (figure: Doc C), as in the case of co-citation analysis, is not required. In addition, an identical match, as in the case of bibliographic coupling, is not required. Co-occurrence analysis can detect latent patterns linking different entities. Co-occurrence analyses are used to analyse the conceptual structure of the scientific research area with a focus on references and keywords (Cobo et al., 2011a).

The processing of cited references is a challenging task because the form of citations can differ. "VOSviewer starts by parsing cited references in order to identify their constituent elements, such as author names, publication years, source titles, volume numbers, and so on" (van Eck & Waltman, 2020, p. 31). After parsing the references, a match key for each reference is constructed by combing the name of the first author, the publication year, the volume (if not available the journal title) and the beginning page number (or, if the beginning page number is not available, the article number). If no match key can be constructed, the DOI is used, and if no DOI is available, the raw reference string is used as the match key. Match keys were constructed for each document. If matching match keys between documents exist, a bibliographic coupling link is established. Bibliographic coupling links between countries, journals and authors are "aggregated from the level of individual documents to the aggregate level" (van Eck & Waltman, 2020, p. 32).

3 Results

3.1 Data Corpus

Basic information about the selected data is shown in Table 1.

Table 1: Data Corpus

Variable	Timespan				
	2011–2012	2013–2014	2015–2016	2017–2018	2019–2020
Documents	830	864	1,093	1,128	1,561
Authors	1,654	1,868	2,416	2,729	3,884
Average citations per documents	13.30	10.66	7.93	5.35	2.41
Average cit. per year per doc.	1.27	1.26	1.22	1.20	0.96
References	29,952	33,754	43,003	46,307	65,426
References per doc	36.09	39.07	39.34	41.05	41.91
Author's keywords per doc	2.82	2.91	3.04	3.11	2.96
Authors of single-authored documents	305	288	305	310	342
Authors of multi-authored documents	1,349	1,580	2,111	2,419	3,542
Single-authored documents	320	307	334	326	365
Multi-authored documents	510	557	759	802	1196
Documents per author	0.50	0.46	0.45	0.41	0.40
Authors per document	1.99	2.16	2.21	2.42	2.49
Co-authors per documents	2.24	2.36	2.50	2.63	2.79

Analysis with r pagage bibliometrix (Aria & Cuccurullo, 2017). Article N = 5,474.

The number of articles has increased by 731 in 10 years, from 830 to 1,561. This represents an increase of 88%. While the growth of articles was moderate from 2011 to 2018, there has been considerable growth since 2019. Furthermore, the number of authors has risen even more sharply, by 2,230, from 1,654 to 1,561 in 10 years. This represents an increase of 135%. Overall, it can be noted that the number of indexed actors in the field has increased. The figures show that the subject area studied has gained considerable scientific importance over the last 10 years.

The number of single-authored articles increased only slightly by 45 articles over the study period, from a total of 320 in 2011 and 2012 to a total of 365 articles in 2019 and 2020. This small growth corresponds to an increase of 14%. In contrast, the number of multi-authored articles increased massively by 686 articles over the study period, from a total of 510 articles in 2011 and 2012 to a total of 1,196 articles in 2019 and 2020. This growth corresponds to an increase of 135%. While the ratio of single-author articles to multi-author articles was 39.61% in 2011/12, the ratio in 2019/2020 is 23.77%. The number of authors per article has

also grown from about 2 in 2011/2012 to 2.5 in 2019/2020. How are these values to be interpreted? Harzing and Alakangas (2016) found in their study that social sciences and humanities academics published papers with 2 to 2.5 authors. The determined number of 2.5 authors per article is thus not conspicuous in the context of these disciplines. However, it should be noted that the number of authors per article is increasing, which may be an indicator that the problems studied have become more complex. In addition, the scientific field as a whole can be described as cooperation-oriented, with almost 80% of articles being multi-author.

3.2 Analysis of Countries

3.2.1 Local Most Productive and Most Cited Countries

Based on a bibliographic coupling link analysis, the local (in the data corpus) most productive (in the sense of the number of papers published) and most cited countries are shown in Table 2. In the bibliometric data, each author is indicated with his or her institutional affiliation, which in turn determines the country affiliation. Thus, the country affiliation does not refer to the nationality of the scientist, but to the nationality of the science environment, the science institution and community hosting her of him.

The threshold for including a country in the analysis was set to a minimum number of 30 published articles per country. Thirty-four countries met the threshold. For each of the 34 countries, the number of articles (Art.) and citations (Cit.), the article effectiviness (AE) and the total bibliographic coupling links strengths (TBCLS) were calculated. The number of articles for a country refers to the total number of articles in the selected local data corpus. The number of counted citations of a country refers to the total number of citations of an article that Scopus records for the respective article. The counting method used to calculate the TBCLS was fractional. Fractional counting means that the weight of a bibliographic link is fractionated and thus proportionally divided and distributed among the countries of the co-authors. If multiple author countries are involved in an article, for example, and the total number of author countries is 3, then the bibliographic coupling links of a co-authorship country has a weight of 1/3. The countries in Table 2 are sorted in descending order according to the total bibliographic coupling link strengths (TBCLS).

Table 2: Local Most Productive and Most Cited Countries

Country	Art.	Cit.	AE	TBCLS	Country	Art.	Cit.	AE	TBCLS
United Kingdom	965	8440	8.75	12360	Denmark	73	710	9.73	1534
United States	695	6912	9.95	9888	Austria	51	358	7.02	1490
Germany	428	3526	8.24	8592	Italy	75	391	5.21	1241
Australia	517	5792	11.20	8399	Taiwan	80	884	11.05	1196
Netherlands	283	4018	14.20	6913	Brazil	109	232	2.13	1080
Switzerland	188	1431	7.61	4760	Portugal	45	215	4.78	1012
Finland	132	1499	11.36	3928	South Korea	43	263	6.12	999
Canada	179	2353	13.15	3822	Indonesia	82	231	2.82	978
Sweden	178	1382	7.76	3740	India	76	472	6.21	937
China & Hong Kong	155	825	5.32	2840	Ireland	42	296	7.05	823
Belgium	75	937	12.49	2715	Turkey	73	213	2.92	815
Spain	237	979	4.13	2405	Greece	47	118	2.51	796
Norway	87	564	6.48	2251	Nigeria	51	95	1.86	786
South Africa	117	738	6.31	2005	Russia	241	701	2.91	745
New Zealand	72	578	8.03	1851	Chile	35	92	2.63	614
France	155	528	3.41	1739	Slovenia	30	102	3.40	492
Malaysia	162	538	3.32	1610	Thailand	34	62	1.82	339

Art. = Articles, Cit. = Citations, AE: Article Effectiveness = Citations/Articles, TBCLS = Total Bibliographic Coupling Link Strengths; analysis and calculation by VOSViewer.

The country with the highest number of publications (N=965) and citations (N=8440) is, by far, the United Kingdom, followed by the United States of America and Australia. The country with the highest publication effectiveness is the Netherlands (14.2), followed by Canada and Belgium. The country with the highest total bibliographic coupling links is again the United Kingdom (12360) followed by the United States of America and Germany.

3.2.2 Bibliographic Coupling Between Countries

Bibliographic couling means that if two documents share the same reference(s), they are bibliographically coupled. Since the representation of the visualisation in Figure 3 is distance-based, this means that the closer two countries are in the network, the more similar the literature references used. We made the following assumption: The similarity of the used literature references between countries can be interpreted as the similarity of thinking between countries. After the calculation of the strengths of the total bibliographic coupling link, we clustered the network two times: The first time with a resolution of 1.0 (Figure 3a) and the second time with a coarser resolution of 0.8 (Figure 3b). The distance-based graph does not change, as this graph is based on the bibliographic coupling links between each country, but the clusters are different.

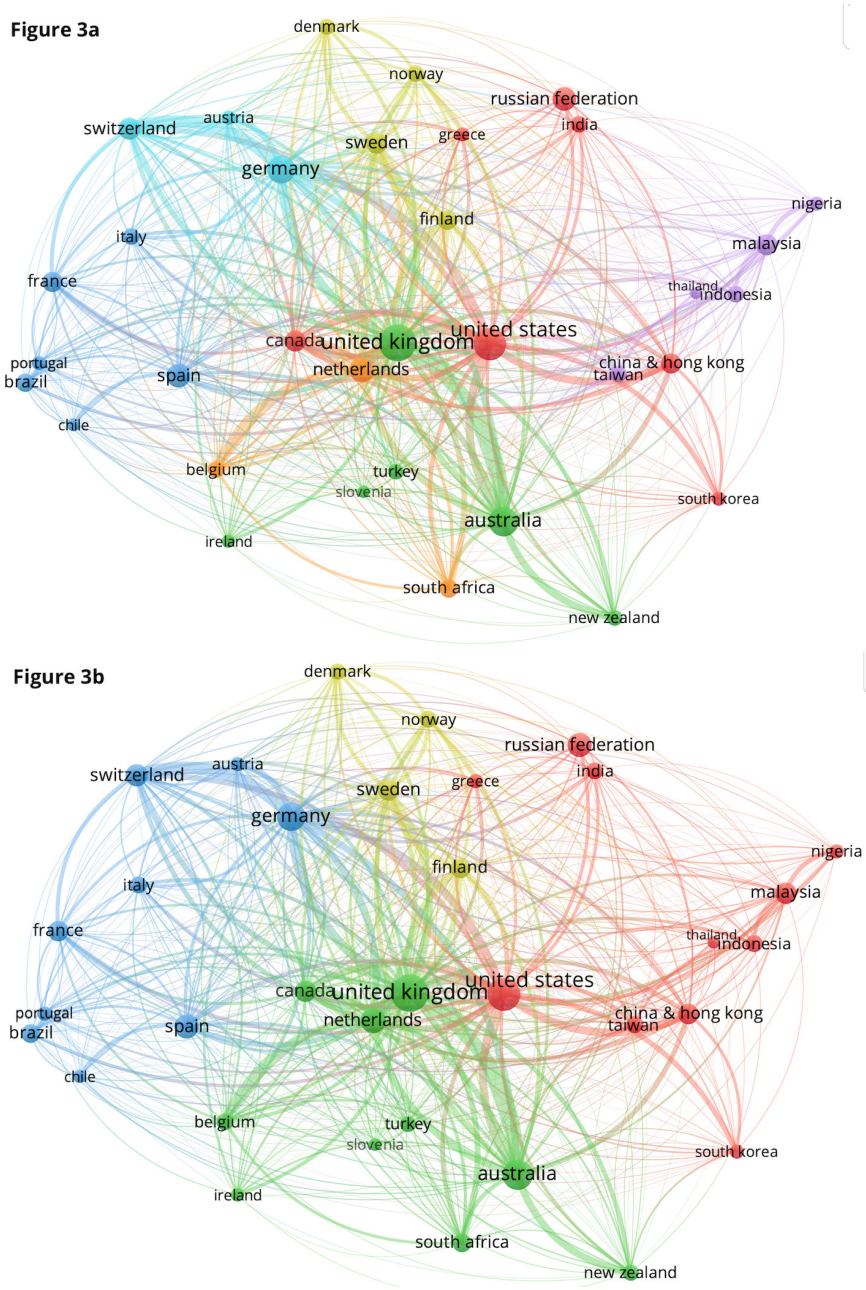


Figure 3: Bibliographic Coupling Between Countries (Weights: TBCLS)

Brief summary of the method – the key parameters used to calculate and visualise the country network and clusters: The type of analysis is a bibliographic coupling. The unit of analysis is countries. The threshold is a minimum of 30 documents from one country. We selected all

countries that resulted (N=34). Relatedness was calculated using the fractional count method and an attraction coefficient of 2 and a repulsion coefficient of 1. Normalisation of relatedness values was performed using the association strength technique. Cluster resolution was set to 1.0 in Figure 3a and 0.8 in Figure 3b.

In Table 3, the two solutions (Figure 3a and Figure 3b) are presented. The countries are sorted within the cluster in descending order based on their total bibliographic coupling link strengths.

Table 3: Clusters of Countries Based on Bibliographic Coupling

Cluster		Countries	Cluster	Colour 3b
1	Red	United States of America, Canada, China & Hong Kong, South Korea, India, Greece, Russian Federation	1	Red[1]
2	Purple	Malaysia, Nigeria, Taiwan, Indonesia, Thailand		
3	Blue	Spain, France, Italy, Brazil, Portugal, Chile	2	Blue
4	Cyan	Germany, Switzerland, Austria		
5	Green	United Kingdom, Australia, New Zealand, Ireland, Turkey, Slovenia	3	Green[2]
6	Orange	Netherlands, Belgium, South Africa		
7	Yellow	Finland, Sweden, Norway, Denmark	4	Yellow

[1] without Canada, [2] with Canada; analysis and calculation by VOSViewer

The seven-cluster solution (Figure 3a) partly confirms assumptions of homogeneity: The German-speaking countries Germany, Switzerland and Austria are grouped within one cluster (cyan), and the Romance-speaking countries Spain, France, Italy, Portugal, Brazil and Chile are grouped in another cluster (blue). Malaysia, Indonesia, and Thailand together form a Southeast Asia cluster (purple), but this cluster also includes Taiwan and Nigeria. Nigeria is surprising at first glance, but understandable because Nigeria and Malaysia have a great closeness in TVET development and cooperation (Mohammad & Ismail, 2019). Taiwan is more closely situated to China in the distance-based map (therefore a high bibliographic coupling) but, after clustering, placed together with Malaysia, Indonesia, Thailand, and Nigeria within one cluster (purple). The researchers from Finland, Sweden, Norway, and Denmark form another regional cluster (yellow), as do the United Kingdom, Australia, New Zealand and Ireland, together with Turkey and Slovenia (green). The Netherlands, Belgium and South Africa together form a small sixth cluster (orange), and the United States of America, along with the Russian Federation, Canada, China & Hong Kong, India, Greece, South Korea a seventh large cluster (red). In the four-cluster solution, some clusters remain largely stable (red, blue, green and yellow), while others merge: the German-speaking and the Romance-

speaking countries are forming a joint cluster, the clusters led by the United Kingdom and the Netherlands, and the clusters led by the United States and Malaysia form another cluster.

The similarity of thinking appears to be influenced by historical-cultural, regional-economic and/or political factors (e.g., Finland, Sweden, Norway, and Denmark; Malaysia, Indonesia, and Thailand; United Kingdom, Australia, and New Zealand). Partial correspondence exists with typologisations that also lead to clusters: In the seven-cluster version, the German-speaking cluster (Germany, Switzerland, and Austria) can be clearly identified as countries with a *collective skill formation system*; however, while the UK and USA are in our analysis in different clusters, both should be situated in one cluster named *liberal skill formation system*. Also, Sweden and France are in different clusters in our analysis, but both countries should be merged in a cluster named the *statist skill formation system* (Busemeyer & Trampusch, 2012; Busemeyer & Iversen, 2012). Greinert (1999, 2004) distinguishes three prototypes of vocational training regimes: A dual-corporatist model, as implemented in Germany; a state-regulated bureaucratic model, as implemented in France; and a liberal market economy model, as implemented in the United Kingdom. In the seven-cluster solution, our analysis agrees with Greinert's, but in the four-cluster solution, Germany, and France merge into one cluster. Only the United Kingdom is in a different cluster. Also, the typology of Pilz does not fit to the identified clusters: Pilz (2016) assigns the USA, India, and China to different purposes. In both cluster analysis versions, these countries form a common cluster. However, this need not be a contradiction insofar as the typologisation by Greinert and Pilz represents a finer level of detail than the clusters presented here. Furthermore, despite the diversity of Scandinavian VET systems (Jørgensen et al., 2018), researchers from Finland, Sweden, Norway, and Denmark form a joint cluster. We can draw the following conclusion: Despite the diversity of vocational education and training systems in different countries, there is a high degree of convergence within clusters and divergence between clusters in thinking, which is expressed in the formation of different bibliographic coupled clusters.

3.3 Analysis of Journals

3.3.1 Local Most Productive and Most Cited Journals

Based on a bibliographic coupling link analysis, the local most productive and most cited journals are shown in Table 4. The threshold for including a country in the analysis was set to a minimum number of 5 published articles per country. The 30 journals with the highest bibliographic coupling link strengths were selected. For each of the 30 journals, the number of articles (Art.) and citations (Cit.), the article effectiviness (AE) and the total bibliographic coupling links strengths (TBCLS) were calculated. The number of articles for a journal refers to the total number of articles in the selected local data corpus. The number of citations

counted for a journal refers to the total number of citations of an article that Scopus records for the respective article. The counting method to calculate the TBCLS was full counting: Each bibliographic coupling link of a journal has a weight of 1. The coverage period in Scopus (Cov.) was checked, as not all journals cover the full period from 2011 to 2020. The coverage of the *Journal of Technical Education and Training* started in 2016, and the coverage of the *International Journal for Research in Vocational Education and Training* in 2014. The journals in Table 4 are sorted in descending order according to the total bibliographic coupling link strengths (TBCLS) of the individual journal.

Table 4: Local Most Productive and Most Cited Journals

Journal	Cov.	Art.	Cit.	AE	TBCLS	C^1	C^2
Journal of Vocational Education and Training	[1]1996	281	2232	7.94	35506	1	1
Vocations and Learning	2009	98	1330	13.57	25507	2	2
Journal of Workplace Learning	1997	132	1115	8.45	24122	2	2
Higher Education, Skills and Work-Based Learning	2010	146	684	4.68	16384	3	3
Research in Post-Compulsory Education	1996	111	476	4.29	12579	4	3
Journal of Education and Work	2005	79	601	7.61	12290	1	1
International Journal of Training Research	2012	113	404	3.58	10298	6	1
International Journal for Research in VET	2014	99	463	4.68	9358	1	1
Education and Training	1959	70	657	9.39	8783	3	3
Studies in Continuing Education	[2]1978	35	270	7.71	7898	2	2
Advances in Health Sciences Education	1996	33	684	20.73	7060	5	2
Journal of Further and Higher Education	1977	54	313	5.80	6212	4	3
Empirical Research in VET	2009	80	465	5.81	5627	1	1
Professional Development in Education	2009	16	117	7.31	3453	2	2
International Journal of Lifelong Education	1982	17	85	5.00	3173	1	1
Studies in Higher Education	1976	19	275	14.47	3081	4	3
Teaching and Teacher Education	1985	15	533	35.53	2815	2	2
Medical Education	1966	16	1094	68.38	2724	5	2
Teaching in Higher Education	2005	12	162	13.50	2466	3	3
BMC Medical Education	2001	47	741	15.77	2278	5	2
British Journal of Educational Technology	1970	19	386	20.32	2229	2	2
Medical Teacher	1979	36	1559	43.31	2172	5	2
Learning Organization	1994	10	98	9.80	1987	2	2
Zeitschrift für Erziehungswissenschaft	2008	28	168	6.00	1925	1	1
Formation Emploi	[3]2012	54	51	0.94	1880	1	1
Industry and Higher Education	1996	16	47	2.94	1808	3	3
Sport, Education and Society	1996	8	43	5.38	1721	4	3
Bitish Journal of Sociology of Education	1980	19	202	10.63	1693	4	3
Journal of Technical Education and Training	2016	72	155	2.15	1651	6	2
European Journal of Education	2005	17	121	7.12	1646	1	1

Cov. = Covered years in Scopus (according to Scimago), Art. = Articles, Cit. = Citations, AE: Article Effectiveness = Citations/Articles, TBCLS = Total Bibliographic Coupling Link Strengths, C^1 = Six-cluster-solution, C^2 = Three-cluster-solution; [1] the journal changed in 1996 with the first issue of Volume 48 its title from *The Vocational Aspect of Education* to the *Journal of Vocational Education and Training*. [2] without the years 1983 – 1987, [3] the coverage ends in 2019; analysis and calculation by VOSViewer.

The journal with the highest number of publications is, by far, the Journal of Vocational Education and Training (N=281) followed by the journals Higher Education, Skills and Work-Based Learning (N=146) and the Journal of Workplace Learning (N=132). The journal with the highest number of citations is also, by far, the Journal of Vocational Education and Training (N=2232) followed by Vocations and Learning (N=1330) and Journal of Workplace Learning (N=1115). The journal with the highest publication effectiveness is Medical Education (68.38), followed by Medical Teacher (43.31) and Teaching and Teacher Education (35.53). Despite this high effectiveness of the medical journals, the Journal of Vocational Education and Training, Vocations and Learning and the Journal of Workplace Learning show the highest total bibliographic coupling link strengths, which means that they have the highest bibliographic embeddedness in the considered research field.

3.3.2 Bibliographic Coupling Between Journals

To identify the reference overlap between journals, we again used the bibliographic coupling method. Since the representation of the visualisation in Figure 4 is distance-based, this means that the closer two journals are in the network, the more similar the literature references used.

Brief summary of the method – the key parameters used to calculate and visualise the journal network and clusters: The type of analysis is a bibliographic coupling. The unit of analysis is journals. The threshold is a minimum of 5 articles from one journal. We selected the 30 journals with the highest total link strengths in the data corpus. Relatedness was calculated using the full counting method and an attraction coefficient of 2 and a repulsion coefficient of 1. Normalisation of relatedness values was performed using the association strength technique. Cluster resolution was set to 1.1 in Figure 4 and 1.0 in Figure 5.

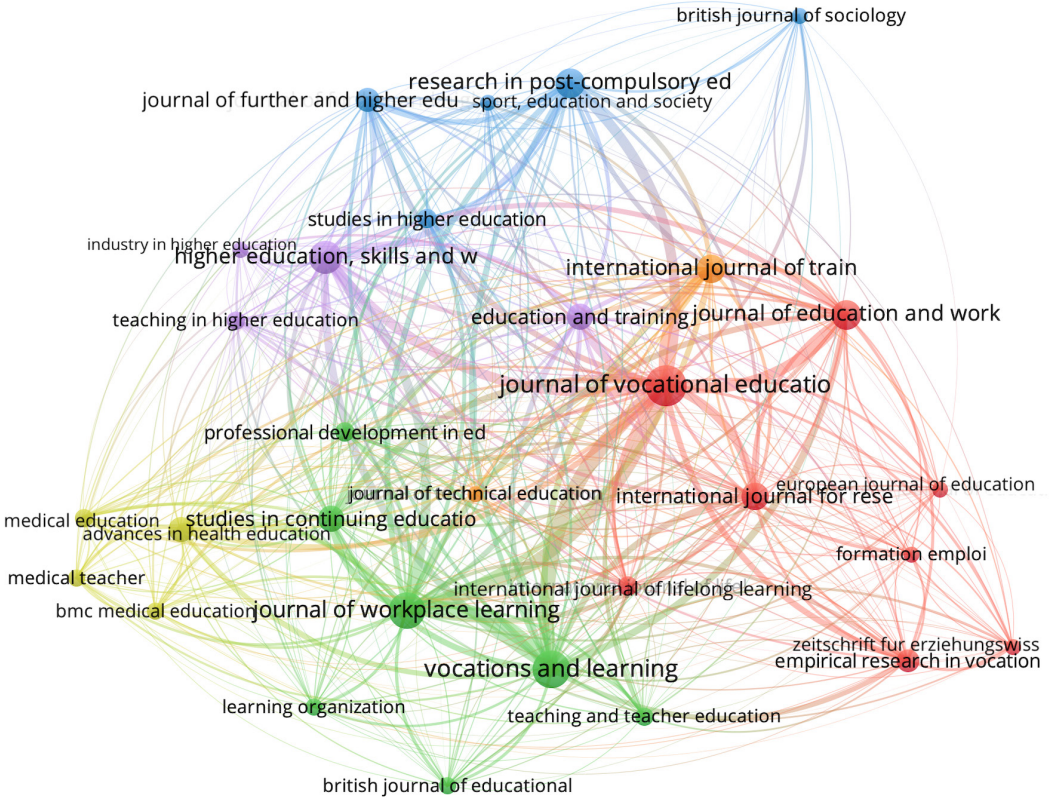


Figure 4: Bibliographic Coupling Between Journals With six Clusters (Weights: TBCLS)

After the calculation of the total bibliographic coupling link strengths, we clustered the network with a resolution of 1.1 (greater detail) and received 6 clusters (Figure 4) with 8 (red), 7 (green), 5 (blue), twice 4 (purple and yellow) journals and one cluster with 2 journals (orange). The biggest cluster, with 8 journals (red), can be considered "VET research with high reference to educational research". The second core cluster, with 7 journals (green), can be described as "VET research with a focus on workplace learning and professional development". Accordingly, the third cluster (yellow), "VET research in medical education", is located close to this second green cluster. Equally appropriately, the purple cluster with 4 journals is positioned close to the second and third clusters, with its focus on "work-based learning and higher education". This purple cluster is followed by a blue cluster that focuses more on "higher education and continuing vocational education and training". The smallest orange cluster is unusual because the respective journals are embedded in other clusters due to the high bibliographic coupling link strengths with other journals. Regionality[1] could be an explanation for this phenomenon.

1 The *International Journal for Training Research* focuses on VET in Australia and internationally, and the Technical Journal of Edcuation and Training on VET in the the South Asian region and internationally.

In the second approach, we clustered the journals with a regular resolution (1.0) and received a three-cluster solution (Figure 5).

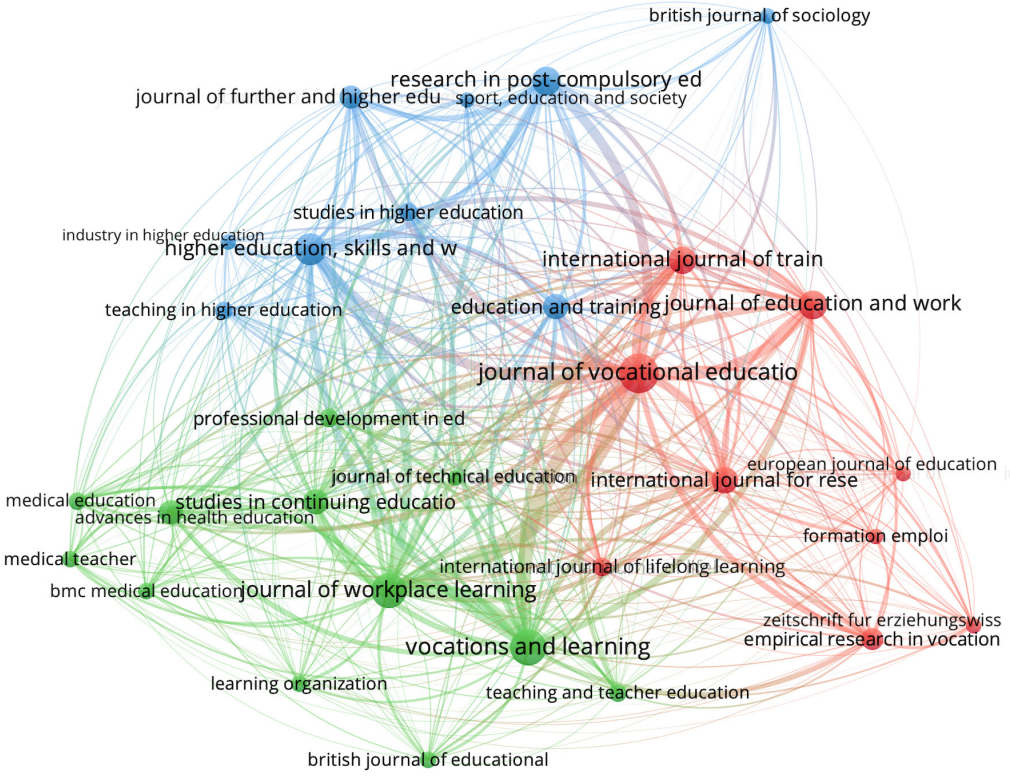


Figure 5: Bibliographic Coupling Between Journals With Three Clusters (Weights: TBCLS)

The three-cluster solution (Figure 4) reinforces the trend already visible in the six-cluster solution: The cluster "VET research with high reference to educational research" (red) has increased; the clusters "VET research with a focus on workplace learning and professional development" and "VET research in medical education" merged into "workplace learning, professional development and medical education" (green); and the two clusters "work-based learning and higher education" and "higher education and continuing vocational education and training" merged into "work-based learning, higher education and continuing vocational education and training" (blue). The small orange cluster (Figure 4) has dissolved and is now embedded. It is recognisable that the research field as a whole is not mono-disciplinary, with only one scientific approach, but multi-disciplinary.

3.4 Analysis of Authors

3.4.1 Most Productive Authors

The most productive authors within our data sample, along with their most cited articles published between 2011 and 2020, are listed in Table 5.

Table 5: Most Productive Authors With 10 or More Articles

Author	Cou.	Art.	Most cited article in the data corpus (2011–2020)	Year	Cit.
Pilz, M.	DE	28	"Typologies in Comparative Vocational Education: Existing Models and New Approach"	2016	37
Cattaneo, A.	CH	21	"The 'Erfahrraum': A Pedagogical Model for Designing Technologies in Dual Systems"	2015	30
De Bruijn, E.	NL	18	"Authentic and Self-Directed Learning in Vocational Education and Training: Challenges to Vocational Educators"	2011	92
Tran, L.	AU	17	"Mobility as Becoming: Bourdieuian Analysis of the Factors Shaping International Mobility"	2016	79
Billett, S.	AU	14	"Learning through Work: Emerging perspectives and new challenges "	2013	92
Smith, R.	UK	13	"New Public Management in an Age of Austerity: Knowledge and Experience in Further Education"	2013	33
Rosvall, P.	SE	13	"The Vocational-Academic Divide in Neoliberal Upper Secondary Curricula: The Swedish Case"	2017	29
Gurtner, J.	CH	12	"The 'Erfahrraum': A Pedagogical Model for Designing Technologies in Dual Systems"	2015	30
Baartman, L	NL	12	"Students' Learning Processes during School-Based Learning and Workplace Learning in Vocational Education: A Review"	2012	85
Nylund, M.	SE	11	"The Vocational–Academic divide in Neoliberal Upper Secondary Curricula: The Swedish Case"	2017	29
Chan, S.	NZ	11	"Learning Through Apprenticeship: Belonging to a Workplace, Becoming and Being, Vocations and Learning"	2013	35
Lester, S.	UK	11	"Work-based Doctorates: Professional Extension at the Highest Levels"	2012	48
Avis, J.	UK	10	"Socio-Technical Imaginary of the Fourth Industrial Revolution and Its Implications for Vocational Education and Training: A Literature Review"	2018	33
Simmons, R.	UK	10	"Ordinary Lives: An Ethnographic Study of Young People Attending Entry to Employment Programmes"	2011	19
Taylor, A.	CA	10	"'Made in the Trade': Youth Attitudes Toward Apprenticeship Certification"	2011	20
Smith, E.	AU	10	"What Makes a Good VET Teacher? Views of Australian VET Teachers and Students"	2017	11

Cou. = Country, Art. = number of articles in the sample, "most cited" Cit. = number of scopus citations of the named article; analysis and calculation by VOSViewer.

Of the 16 authors, three are from the United Kingdom, three from Australia, two from the Netherlands, two from Sweden and Switzerland and one each from Canada, Germany, and New Zealand. The most productive authors are Pilz from the University of Cologne in Germany followed by Cattaneo from Swiss Federal University for Vocational Education and Training in Switzerland and de Bruijn from Open University in the Netherlands.

3.4.2 Most Cited Authors

To identify the most cited author, we used co-citation analysis. Co-citation analysis relies on a third document to identify links between two other documents. The citation analysis is not limited to the publications included in the data corpus: the articles in the corpus have references within the data corpus but also outside of it, especially from a temporal perspective. Thus, its limitation is not based on the decade considered, as in the above analysis of the most productive authors of the last decade, but on the authors' assumptions about which authors are relevant to their own work. We set the threshold to 50 citations of an author, calculated the total co-citations links strengths, and selected the 250 authors with the greatest total co-citations link strengths (TCCLS). The resulting co-citation network is shown in Figure 6.

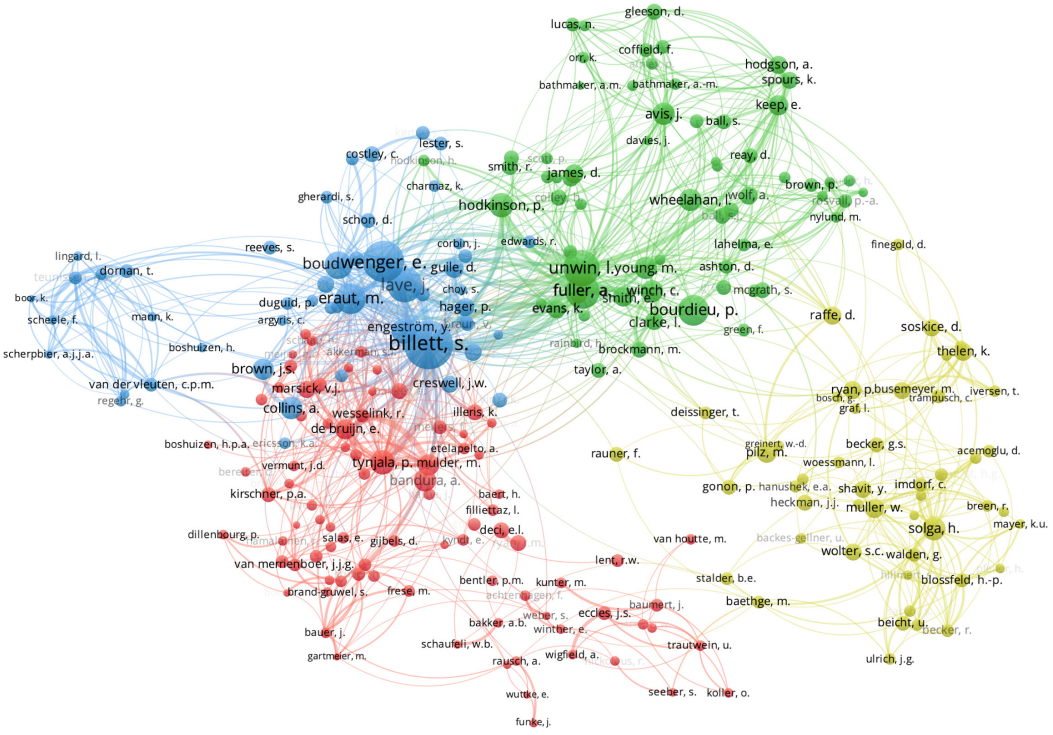


Figure 6: Co-Citation Analysis of the 250 Most Influential Authors (Weights: TCCLS)

Brief summary of the method – the key parameters used to calculate and visualise the cited author network and clusters (Figure 6): The type of analysis is a co-citation analysis, and the unit of analysis is cited authors. Threshold: An author must be cited at least 20 times. We selected the 250 cited authors with the highest total co-citation link strengths in the data corpus. Relatedness was calculated using the fractional counting method, an attraction coefficient of four and a repulsion coefficient of one. Normalisation of relatedness values was performed using the association strength technique. Cluster resolution was set to 1.0.

Of the 250 authors, we selected the 30 most cited authors within our data sample (Table 6).

Table 6: The 30 Most Cited Authors

Author	Cou.	Cit.	TCCLS	Author	Cou.	Cit.	TCCLS
Billett, S.	AU	1121	21855	Engeström, Y.	FI	359	5989
Unwin, L.	UK	660	15011	Keep, E.	UK	255	5483
Fuller, A.	UK	592	13371	Solga, H.	DE	307	5271
Wenger, E.	US	827	11943	Wheelahan, L.	CA	298	5090
Eraut, M.	UK	502	9859	Clarke, L.	UK	216	5006
Tynjala, P.	FI	350	9354	James, D.	UK	233	4856
Lave, J.	US	618	9007	Bourdieu, P.	FR	502	4551
Hodkinson, P.	UK	349	8290	Evans, K.	UK	201	4324
De Bruijn, E.	NL	250	7292	Hager, P.	AU	213	4295
Winch, C.	UK	294	6640	Muller, W.	DE	221	4172
Mulder, M.	NL	265	6324	Brockmann, M.	UK	172	4145
Avis, J.	UK	284	6229	Hodgson, S.	UK	201	4055
Young, M.	UK	291	6105	Wesselink, R.	NL	140	3910
Guile, D.	UK	228	6060	Kirschner, P.A.	NL	144	3886
Boud, D.	AU	414	6015	Thelen, K.	US	210	3868

Cou. = Country, Cit. = Citations, TCCLS = Total Co-Citation Link Strengths; analysis and calculation by VOSViewer.

Interestingly, 14 of the 30 most influential authors were from the UK. Of these 14, six (Unwin, Fuller, Young, Guile, Clarke, Evans) were associated with the University College London (UCL). When researchers from the United States (3), Australia (3) and Canada (1) were included, a total of 21 researchers came from the context of liberal skill formation systems, which "combine low levels of public investment in VET with little firm involvement. In these educational systems, VET is subordinated to academic education" (Busemeyer and Iversen, 2012, p. 218). It is likely that the research strength of researchers from the aforementioned countries significantly influence the discourse on research at the boundary between learning and working.

3.5 Analysis of References

In this step, using SciMAT, we performed a co-occurrence analysis of the references, clustered the references, and developed a strategic map based on the centrality and density measures of the reference networks and clusters. For normalisation, we used the association strength method. For mapping, we employed the union mapper method, and for clustering, we used the simple center algorithm and limited the network size to four references with a limit of three references. The strategic map is shown in Figure 7.

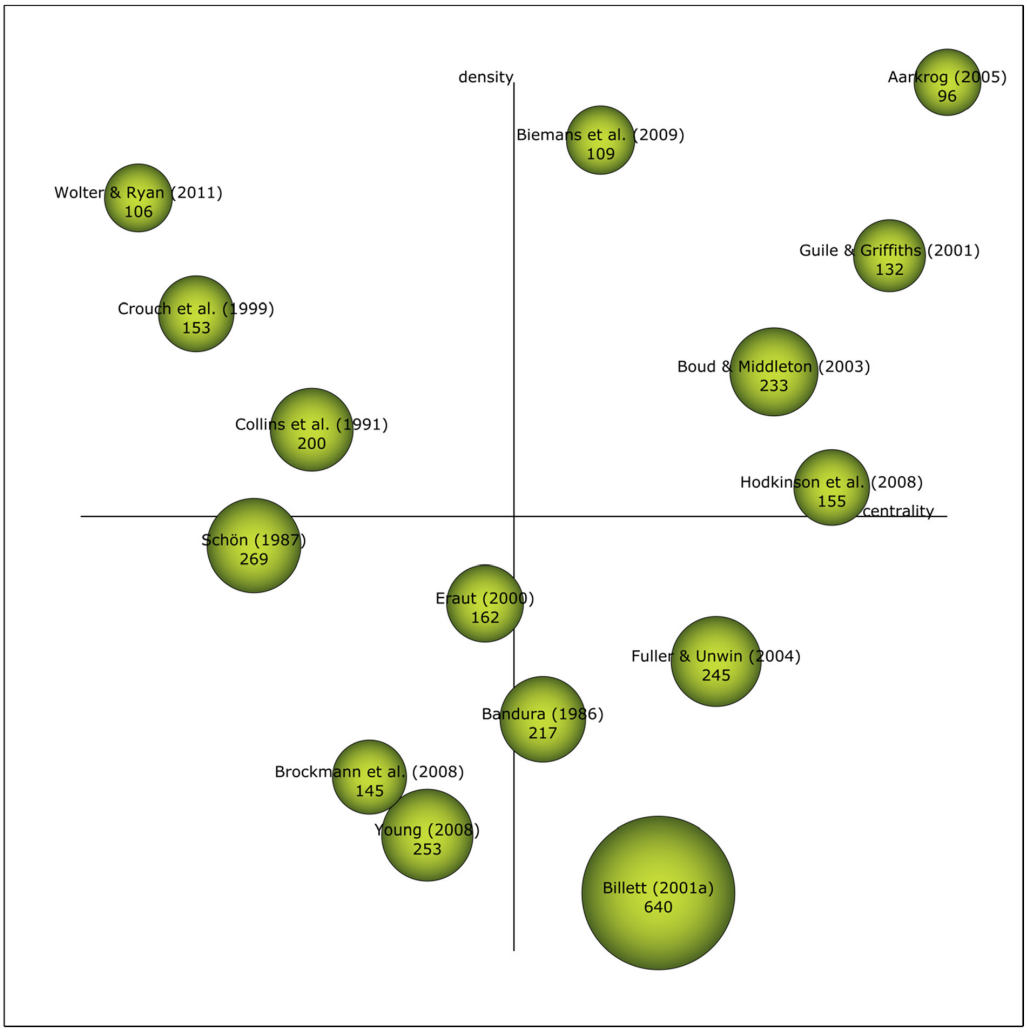


Figure 7: Strategic Map of Clustered References (Weight: Documents)

A major cluster or theme in the *motor clusters* (top right) quadrant is the Boud and Middleton (2003) cluster with its focus on workplace and informal learning. Another large cluster is Hodkinson et al. (2008) with its focus on apprenticeship training considering, for example, principles of individual and social learning. The largest cluster, Billett (2001a), in the *basic and transversal clusters* (bottom right) quadrant, which is also the largest cluster in the entire field, provides the foundations for specific additional research applications (e.g., informal learning, learning from others in the workplace) with a focus on situated learning and communities of practice. The second largest cluster in this quadrant, Fuller and Unwin (2004), represents the learning opportunities and learning constraints in the context of work and work systems. In the *highly developed and isolated clusters* (top left) quadrant, two clusters are prominent – the Crouch et al. (1999) cluster, which considers the system level and the political economy of skill creation (macro system level), and the Collins et al. (1991) cluster, which analyses the level of teaching and learning based on the cognitive apprenticeship (micro system level) approach. Within the *emerging or declining clusters* (bottom left) quadrant, the Young (2008) cluster focuses on relationships between educational policy and practice, between vocational (upper-secondary) education and employment and between learning culture and identity. In this cluster, perspectives on sociology of education are addressed. The Schön (1987) cluster also focuses on a relationship but, here, it is that between higher education and work-based learning. The other clusters and their topics should only be briefly addressed. The Aarkrog (2005) cluster focuses on the connection between work-based and school-based learning and the objects at the boundary. The Biemans et al. (2009) cluster represents the discourse on competence-based vocational education and its dilemmas and practical tensions, and the Guile and Griffiths (2001) cluster covers learning through work experiences and workplace learning. The Wolter and Ryan (2011) cluster concentrates on the economics of vocational education and training, such as costs of training and unemployment in relation to labour market conditions and/or willingness of companies to train. The focus of the Eraut (2000) cluster is the relation between professional education and learning in the workplace with slightly deep insights on adaptive and developmental learning as well as emotional and practical learning. The Brockmann et al. (2008) cluster focuses on comparative research of educational systems and their similarities and differences in the context of liberal and coordinated economies, unifying processes, such as the creation of political frameworks (e.g., European Qualifications Framework), and system reforms. The clusters briefly characterized above and shown in Figure 7 are presented in Table 7 along with other related references.

Table 7: Centrality and Density of Clustered References

Cluster Name	C	CR	D	DR	DOC	Further References Within the Cluster
Aarkrog (2005)	2.76	1	1.26	1	96	Akkerman & Bakker (2012), Griffiths & Guile (2003), Schaap et al. (2012)
Biemans et al. (2009)	1.43	0.6	1.09	0.93	109	Biemans et al. (2004), De Bruijn & Leeman (2011), Clarke & Winch (2007)
Guile & Griffiths (2001)	2.39	0.93	0.7	0.8	132	Akkerman & Bakker (2011), Billett (2002), Tynjälä (2013)
Wolter & Ryan (2011)	0.41	0.07	1.04	0.87	106	Acemoglu & Pischke (1998), Acemoglu & Pischke (1999), Ryan (2001)
Crouch et al. (1999)	0.73	0.13	0.65	0.73	153	Allmendinger (1989), Busemeyer & Trampusch (2012), Finegold & Soskice (1988)
Hodkinson et al. (2008)	1.97	0.87	0.37	0.53	155	Billett (2011), Fuller & Unwin (2003), Sfard (1998)
Boud & Middleton (2003)	1.69	0.8	0.47	0.67	233	Billett (2004), Eraut (2004), Fuller et al. (2005)
Eraut (2000)	1.25	0.47	0.34	0.4	162	Dornan et al. (2007), Ellström (2001), Eraut (2007)
Fuller & Unwin (2004)	1.62	0.73	0.32	0.33	245	Billett (2001b), Engeström (2001), Malloch et al. (2011)
Collins et al. (1991)	0.83	0.27	0.42	0.6	200	Brown et al. (1989), Collins et al. (1989), Hattie (2008)
Schön (1987)	0.83	0.2	0.37	0.47	269	Boud & Solomon (2001), Lester & Costley (2010), Schön (1983)
Brockmann et al. (2008)	0.9	0.33	0.17	0.2	145	Bathmaker & Avis (2005), Bosch & Charest (2008), Eichhorst et al. (2012)
Bandura (1986)	1.34	0.53	0.22	0.27	217	Bandura (1997), Hattie & Timperley (2007), Tynjälä (2008)
Young (2008)	1.01	0.4	0.15	0.13	253	Colley et al. (2003), Iannelli & Raffe (2007), Wolf (2011)
Billett (2001a)	1.44	0.67	0.14	0.07	640	Engeström (1987), Lave & Wenger (1991), Wenger (1998)

C = Centrality, CR = Centrality Range, D = Density, DR = Density Range, DOC = Number of Documents

In our next and final step, we analyse the keywords.

3.6 Analysis of Keywords

We used SciMAT and the co-occurrence analysis to identify the most used and most important keywords in our data corpus. We included keywords with a minimum frequency of 20 in our analysis. For the normalisation of the data, we employed the association strength method as in all other analyses. We mapped the documents using the union mapper technique and clustered the keywords and labelled the clusters using the simple center algorithm and a maximum network size of four. The measurement of the density and centrality of the clusters relative to the other clusters resulted in a strategic map of used keywords as shown in Figure 8.

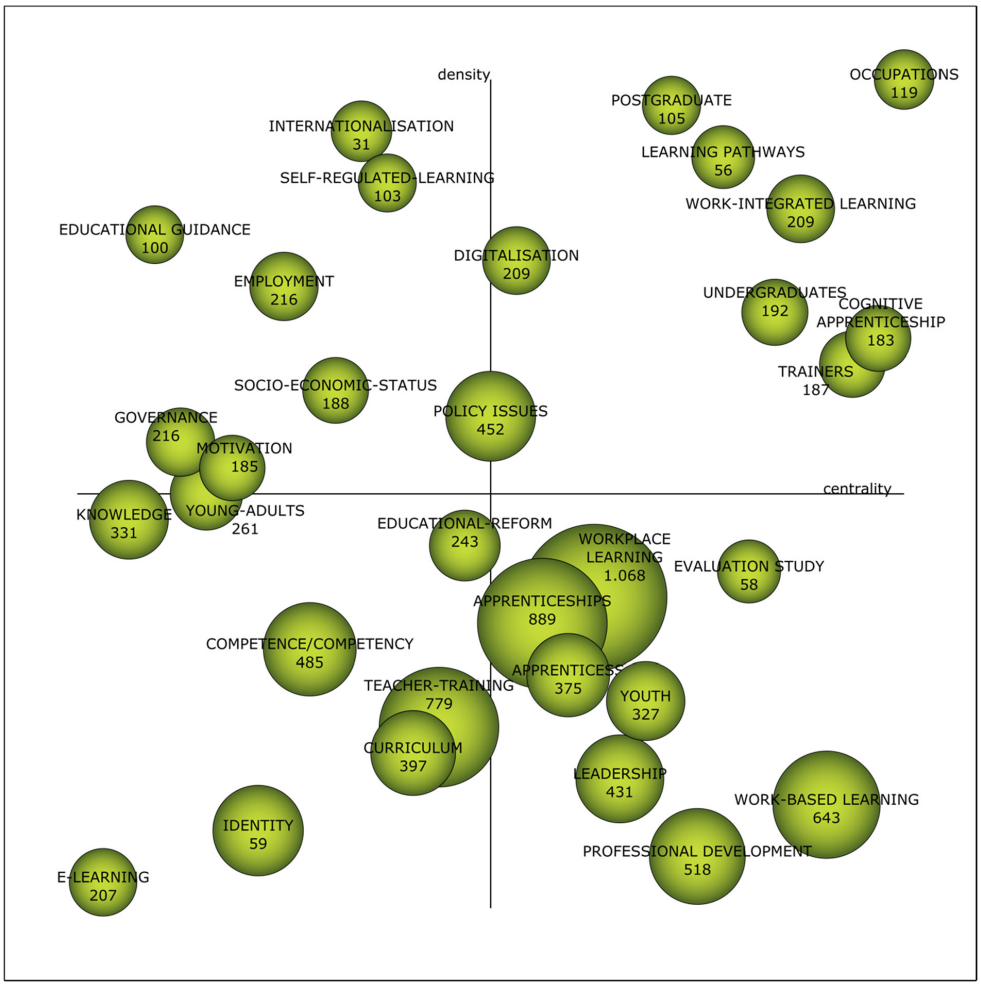


Figure 8: Strategic Map of Clustered References (Weight: Documents)

Major clusters or themes in the motor clusters (top right) quadrant are the keyword clusters *occupations, postgraduates, learning pathways, employability, digitalisation, undergraduates, cognitive apprenticeships, trainers* and close to the sector *highly developed and isolated clusters* (top left) finally the cluster *policy issues*. Major clusters in the *basic and transversal clusters* (bottom right) quadrant are the *workplace learning, evaluation study, apprenticeships, apprentices, youth, leadership, work-based learning and professional development* keyword clusters. The following keyword clusters are prominent in the *highly developed and isolated clusters* (top left) quadrant: *internationalisation, self-regulated learning, educational guidance, employment, socio-economic-status, governance, motivation* and close to the quadrant *emerging or declining clusters* (bottom left) the cluster *young adults*. Finally, the emerging or declining clusters (bottom left) quadrant

includes the *knowledge, educational reform, competence/competency, teacher training, curriculum, identity and e-learning* clusters.

The keyword clusters and their parameters (centrality range coefficient, centrality coefficient, density range coefficient, density coefficient, number of mapped documents per cluster) are shown in Table 8.

Table 8: Most Used Keywords

Name	CR	C	DR	D	MD
Occupations, Traineeships, Qualifications, Trades	1.00	0.97	1.00	0.27	119
Cognitive Apprenticeship, Problem-Based Learning, Experiential Learning, Clinical Education	0.97	0.95	0.69	0.18	183
Trainers, Continuing VET, Lifelong Learning, Ethnography	0.94	0.94	0.66	0.18	187
Work-Based Learning, Higher Education, University, Equality/Inequality	0.91	0.92	0.12	0.05	643
Work-Integrated Learning, Workplace, Employability, Graduates	0.88	0.92	0.84	0.21	209
Undergraduates, Mentoring, Inter-Professional Aspects, Qualitative Research	0.84	0.90	0.72	0.19	192
Evaluation Study, Learning Outcomes, Learning Environments, Internships	0.81	0.88	0.41	0.10	158
Learning Pathways, Career and Technical Education, High School, Communication	0.78	0.88	0.91	0.22	156
Professional Development, Adult Education, Crafts, Career	0.75	0.87	0.06	0.03	518
Postgraduate, Medical Education, Doctoral Education, Situated Learning	0.72	0.87	0.97	0.26	105
Youth, Transitions, Gender, Inclusion	0.69	0.86	0.25	0.08	327
Leadership, Organisational Aspects, Cultural Aspects, Collaborative Practice	0.66	0.82	0.16	0.05	431
Workplace Learning, Informal Learning, Communities of Practice, Learning	0.62	0.82	0.38	0.10	1,068
Apprentices, Training, Simulations, Nursing	0.59	0.82	0.28	0.08	375
Apprenticeships, Skills, Employers, Higher VET and Degree Apprenticeships	0.56	0.82	0.34	0.09	889
Digitalisation, Technology, Engineering, Information Technology	0.53	0.80	0.78	0.19	209
Policy Issues, Comparative Study, Labour Market, Skill-Formation-Systems	0.50	0.78	0.59	0.14	452
Educational Reform, Educational Quality, Dual Apprenticeship, Neo-Liberalism	0.47	0.77	0.44	0.10	243
Teacher Training, Teaching, Further Education, Teachers	0.44	0.77	0.22	0.07	779
Curriculum, Professional Education, Technical Education, Emotions	0.41	0.76	0.19	0.06	397
Self-Regulated Learning, Self-Efficacy, Educational Technology, Ethics	0.38	0.76	0.88	0.22	103
Internationalisation, Migration, Diversity, International Students	0.34	0.76	0.94	0.22	131
Socio-Economic Status, Secondary Education, Adolescence, Case Study	0.31	0.75	0.62	0.15	188
Competence/Competency, Assessment, Competence-Based Approach, Professionalism	0.28	0.74	0.31	0.09	485
Employment, Unemployment, Wages, Capitalism	0.25	0.73	0.75	0.19	216
Students, Academics, Identity, Upper-Secondary School	0.22	0.72	0.09	0.05	459
Motivation, Attitudes, Values, Classroom	0.19	0.72	0.53	0.13	185
Young-Adults, School-to-Work-Transition, Social Capital, Dropouts	0.16	0.70	0.50	0.13	261
Governance, VET-Markets, Partnerships, Colleges	0.12	0.69	0.56	0.14	216
Educational Guidance, Philosophy of VET, Beliefs, Adults	0.09	0.67	0.81	0.2	100
Innovations, Knowledge, Entrepreneurship-Education, SMEs	0.06	0.63	0.47	0.11	331
E-Learning, Blended Learning, Online Learning, Disabilities	0.03	0.41	0.03	0.01	207

CR = Centrality Range, C = Centrality, DR = Density Range, D = Density, MD = Mapped Documents

When the identified keywords are compared with a comprehensive keyword systematization, such as the guide to VOCEDplus subjects and keywords (NCVER, 2021), it can be determined that the 52 subjects mentioned in VOCEDplus are covered. Nevertheless, subjects such as *equity, demographics, disability, disadvantaged, innovation* and specific keywords such as *informal apprenticeships, informal economy, green skills* seem to be underrepresented.

4 Limitations and Further Research

At the outset, we noted that VET structures and practices are very nationally oriented, which is why the field of VET is parcelled internationally. This distribution has implications for research: international VET research is equally parcelled. In our analysis, we identified these intellectual parcels as country networks and clusters, as journal networks and clusters and as author networks and clusters. This scientific parcelling represents a disadvantage for the exchange of ideas and the accumulation of knowledge. In addition to the formation of parcels, there is also a dividing line that runs among the positions of centre, periphery and exclusion. Especially scientists from developing countries and nations, economies in transition and those from post-conflict situations are excluded from the international discourse. This situation is more than just a disadvantage for the exchange of ideas and the accumulation of knowledge. Rather, there is a systematic bias in the research landscape here. Against this background, the parcelling of the discourse and the structuring of the discourse into dominance-periphery-absence, it becomes clear that the presented conceptual structure cannot capture an international perspective but only the perspective of a dominant discourse. The analysis is therefore not wrong, but incomplete and biased.

Bibliometric analysis is a powerful tool for examining large datasets. Techniques such as bibliometric coupling and co-citation analysis visualise latent structures (relations and clusters). However, identifying latent structures does not mean that the detected structures can be explained. For example, our analysis identified a new system for clustering countries, but sufficient interpretation and explanation is not yet available. In this regard, the SciMAT tool performs better than VOSViewer as it orders the identified clusters based on their centrality and density values in a strategic map whereby meaning is created. However, VOSViewer is more efficient than SciMAT, since it parses the examined units (e.g., authors) in advance, whereas in SciMAT, the majority of the data preprocessing and structuring has to be manually performed. VOSViewer is also substantially better than SciMAT at displaying the network itself. In addition to the strategic concept analysis that we have conducted, SciMAT allows, in turn, the comparison of groups of years to identify trends between two time periods. This analysis technique was not employed here. Indeed, this technique would enable an examination of the dataset not only in one cross-section, as we have achieved, but also in several cross-sections based on the number of time periods chosen, which collectively,

would enable a longitudinal perspective. Feasible bibliometric analysis always relies on the capabilities of the software in question and the targeted control of the analyses. We employed therefore Bibliometrix only for the basic analysis of the dataset as we considered the possibility of data cleaning or data preprocessing for an analysis of references (cited authors and articles) limited. However, Bibliometrix is suited for a comprehensive analysis if the source dataset is well structured.

In a comparative analysis of nine bibliometric software tools, the developers of SciMAT determined that "not all the software tools are able to extract all the bibliometric networks, and so, different tools have to be used to analsze a field from different perspectives" (Cobo et al., 2011a, p. 1400). We can confirm this conclusion. Various software can perform basic techniques, such as bibliography coupling and co-citation, to create a bibliometric network. The differences are shown in the details: Certain analyses (e.g., bibliographic coupling of journals) and specific measures (e.g., association strengths, instead of the, e.g., Jaccard's index) are not available. The combination used here (Bibliometrix, VOSViewer and SciMAT) has been proven viable.

As described in section 2.1 *Data Selection*, using only Scopus for the collection of articles had advantages. However, this choice also had disadvantages: A developmental analysis of the research field over time was not possible with our desired tool, CitNetExplorer, as it could only analyse data from the Web of Science Core Collection. Therefore, a temporal analysis is still an open and interesting perspective in the research field presented here. Other disadvantages include the limited coverage of non-English literature in Scopus (Aksnes & Sivertsen, 2019), and the origins keywords. As a rule, authors assign keywords to their articles. Scopus (similar to the Web of Science Core Collection) supplements the authors' keywords. These supplemental keywords have different names: Index keywords, keywords plus, or in SciMAT, a source´s keywords. These keywords extend the author´s keywords to help readers find articles. For example, if an author uses the keyword *workplace learning*, Scopus splits this keyword into two index keywords: *Workplace* and *learning*. The original designation becomes more non-specific, which is a disadvantage for bibliometric analysis. Hence, we only applied the authors' keywords.

The scoping review with the mapping focus is utilised for aggregation, which is both a strength and drawback. Aggregation enables researchers to capture the research field regarding its breadth but only slightly regarding its depth. A critical review, which is performed for interpretation, has opposite strengths and weaknesses. A critical review can only cover the field to a very limited extent but can cover a particular depth. This review paradox cannot be resolved but requires a choice between breadth and depth. Hopefully, these contradictory target perspectives will be better connected in the future using, for example, machine learning methods (López Belmonte et al., 2020). A review that combines the methods applied here with machine learning methods will certainly achieve greater depth. Instead of key-

words, data mining of the whole article could be conducted to enrich the dataset to be analysed. At the interface of data mining and bibliometrics, a new analysis technique is currently being established: bibliomining (Fernández & Bonilla, 2020).

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References

Aarkrog, V. (2005). Learning in the workplace and the significance of school-based education: A study of learning in a Danish vocational education and training programme. *International Journal of Lifelong Education*, *24*(2), 137–147. https://doi.org/10.1080/02601370500056268

Acemoglu, D., & Pischke, J.-S. (1998). Why do firms train? Theory and evidence. *The Quarterly Journal of Economics*, *113*(1), 79–119. https://doi.org/10.1162/003355398555531

Acemoglu, D., & Pischke, J.-S. (1999). Beyond Becker: Training in imperfect training markets. *The Economic Journal*, *109*(453), F112–F142.

Akkerman, S. F., & Bakker, A. (2011). Boundary crossing and boundary objects. *Review of Educational Research*, *81*(2), 132–169. https://doi.org/10.3102/0034654311404435

Akkerman, S. F., & Bakker, A. (2012). Crossing boundaries between school and work during apprenticeships. *Vocations and Learning*, *5*(2), 153–173. https://doi.org/10.1007/s12186-011-9073-6

Aksnes, D. W., & Sivertsen, G. (2019). A criteria-based assessment of the coverage of Scopus and Web of Science. *Journal of Data and Information Science*, *4*(1), 1–21. https://doi.org/10.2478/jdis-2019-0001

Allmendinger, J. (1989). Educational systems and labor market outcomes. *European Sociological Review*, *5*(3), 231–250. https://doi.org/10.1093/oxfordjournals.esr.a036524

Aria, M. & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, *11*(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32. https://doi.org/10.1080/1364557032000119616

Avis, J. (2018). Socio-technical imaginary of the fourth industrial revolution and its implications for vocational education and training: A literature review. *Journal of Vocational Education & Training*, 1–27. https://doi.org/10.1080/13636820.2018.1498907

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.

Bandura, A., (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.

Bathmaker, A.-M., & Avis, J. (2005). Becoming a lecturer in further education in England: The construction of professional identity and the role of communities of practice. *Journal of Education for Teaching*, *31*(1), 47–62. https://doi.org/10.1080/02607470500043771

Bezerra, J., Batista Mota, F., Waltz Comarú, M., Amara Maciel Braga, L., Fernandes Moutinho Rocha, L., Roberto Carvalho, P., Alexandre da Fonseca Tinoca, L., & Matos Lopes, R. (2021). A worldwide

bibliometric and network analysis of work-based learning research. *Higher Education, Skills and Work-Based Learning*, *11*(3), 601–615. https://doi.org/10.1108/HESWBL-03-2020-0035

Biemans, H., Nieuwenhuis, L., Poell, R., Mulder, M., & Wesselink, R. (2004). Competence-based VET in the Netherlands: Background and pitfalls. *Journal of Vocational Education & Training*, *56*(4), 523–538. https://doi.org/10.1080/13636820400200268

Biemans, H., Wesselink, R., Gulikers, J., Schaafsma, S., Verstegen, J., & Mulder, M. (2009). Towards competence-based VET: Dealing with the pitfalls. *Journal of Vocational Education & Training*, *61*(3), 267–286. https://doi.org/10.1080/13636820903194682

Billett, S. (2001a). *Learning in the workplace: Strategies for effective practice*. Allen & Unwin.

Billett, S. (2001b). Learning through work: Workplace affordances and individual engagement. *Journal of Workplace Learning*, *13*(5), 209–214. https://doi.org/10.1108/EUM0000000005548

Billett, S. (2002). Toward a workplace pedagogy: Guidance, participation, and engagement. *Adult Education Quarterly*, *53*(1), 27–43. https://doi.org/10.1177/074171302237202

Billett, S. (2004). Workplace participatory practices: Conceptualising workplaces as learning environments. *Journal of Workplace Learning*, *16*(6), 312–324. https://doi.org/10.1108/13665620410550295

Billett, S. (2011). *Vocational education: Purposes, traditions and prospects*. Springer. https://doi.org/10.1007/978-94-007-1954-5

Bosch, G., & Charest, J. (2008). Vocational training and the labour market in liberal and coordinated economies. *Industrial Relations Journal*, *39*(5), 428–447. https://doi.org/10.1111/j.1468-2338.2008.00497.x

Boud, D. E., & Solomon, N.E. (Eds.). (2001). *Work-based learning: A new higher education?* Taylor & Francis.

Boud, D., & Middleton, H. (2003). Learning from others at work: Communities of practice and informal learning. *Journal of Workplace Learning*, *15*(5), 194–202. https://doi.org/10.1108/13665620310483895

Boyack, K. W., & Klavans, R. (2010). Co-citation analysis, bibliographic coupling, and direct citation: Which citation approach represents the research front most accurately? *Journal of the American Society for Information Science and Technology*, *61*(12), 2389–2404. https://doi.org/10.1002/asi.21419

Brockmann, M., Clarke, L., & Winch, C. (2008). Knowledge, skills, competence: European divergences in vocational education and training (VET)- the English, German and Dutch cases. *Oxford Review of Education*, *34*(5), 547–567. https://doi.org/10.1080/03054980701782098

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated Cognition and the Culture of Learning. *Educational Reseacher*, *18*(1), 32–42. https://doi.org/10.3102/0013189X018001032

Busemeyer, M. R., & Iversen, T. (2012). Collective skill systems, wage bargaining, and labor market stratification. In M. R. Busemeyer & C. Trampusch (Eds.), *The Political Economy of Collective Skill Formation* (pp. 205–233). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199599431.003.0008

Busemeyer, M. R., & Trampusch, C. (2012). The comparative political economy of collective skill formation. In M. R. Busemeyer & C. Trampusch (Eds.), *The political economy of collective skill formation* (pp. 3–40). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199599431.003.0001

Calero López, I., & Rodríguez-López, B. (2020). The relevance of transversal competences in vocational education and training: A bibliometric analysis. *Empirical Research in Vocational Education and Training*, *12*(1), 1–19. https://doi.org/10.1186/s40461-020-00100-0

Callon, M., Courtial, J., & Laville, F. (1991). Co-word analysis as a tool for describing the network of interactions between basic and technological research: The case of polymer chemistry. *Scientometrics*, *22*(1), 155–205. https://doi.org/10.1007/BF02019280

Caves, K. M., Baumann, S., & Renold, U. (2021). Getting there from here: A literature review on vocational education and training reform implementation. *Journal of Vocational Education & Training*, *73*(1), 95–126. https://doi.org/10.1080/13636820.2019.1698643

Cedefop/OECD (2021). *The next steps for apprenticeship*. Luxembourg: Publications Office. Cedefop reference series; No 118 http://data.europa.eu/doi/10.2801/085907

Chan, S. (2013). Learning through apprenticeship: Belonging to a workplace, becoming and being. *Vocations and Learning*, *6*(3), 367–383. https://doi.org/10.1007/s12186-013-9100-x

Clarke, L. & Winch, C. (Eds.). (2007). V*ocational education: International approaches, developments and systems*. Routledge. https://doi.org/10.4324/NOE0415380607

Cobo, M. J., Jürgens, B., Herrero-Solana, V., Martínez, M. A., & Herrera-Viedma, E. (2018). Industry 4.0: A perspective based on bibliometric analysis. *Procedia Computer Science*, *139*, 364–371. https://doi.org/10.1016/j.procs.2018.10.278

Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2012). SciMAT: A new science mapping analysis software tool. *Journal of the American Society for Information Science and Technology*, *63*(8), 1609–1630. https://doi.org/10.1002/asi.22688

Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011a). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the American Society for Information Science and Technology*, *62*(7), 1382–1402. https://doi.org/10.1002/asi.21525

Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011b). An approach for detecting, quantifying, and visualizing the evolution of a research field: A practical application to the Fuzzy Sets Theory field. *Journal of Informetrics*, *5*(1), 146–166. https://doi.org/10.1016/j.joi.2010.10.002

Colley, H., James, D., Tedder, M., & Diment, K. (2003). Learning as becoming in vocational education and training: Class, gender and the role of vocational Habitus. *Journal of Vocational Education and Training*, *55*(4), 471–498. https://doi.org/10.1080/13636820300200240

Collins, A., Brown, J. S., & Holum, A. (1991). Cognitive apprenticeship: Making thinking visible. *American Educator*, *15*(3), 6–11, 38–46. https://www.aft.org/ae/winter1991/collins_brown_holum

Collins, A., Brown, J. S., & Newman, S. E. (1989). Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics. In L. B. Resnick (Ed.), *Knowing, learning, and instruction: Essays in honor of Robert Glaser* (pp. 453–494). Lawrence Erlbaum Associates, Inc.

Colquhoun, H. L., Levac, D., O'Brien, K. K., Straus, S., Tricco, A. C., Perrier, L., Kastner, M., & Moher, D. (2014). Scoping reviews: Time for clarity in definition, methods, and reporting. *Journal of Clinical Epidemiology*, *67*(12), 1291–1294. https://doi.org/10.1016/j.jclinepi.2014.03.013

Costley, C., & Lester, S. (2012). Work-based doctorates: Professional extension at the highest levels. *Studies in Higher Education*, *37*(3), 257–269. https://doi.org/10.1080/03075079.2010.503344

Crouch, C., Finegold, D., & Sako, M. (Eds.). (1999). *Are Skills the answer? The political economy of skill creation in advanced industrial countries*. Oxford University Press.

de Bruijn, E., & Leeman, Y. (2011). Authentic and self-directed learning in vocational education: Challenges to vocational educators. *Teaching and Teacher Education*, *27*(4), 694–702. https://doi.org/10.1016/j.tate.2010.11.007

Dobricki, M., Evi-Colombo, A., & Cattaneo, A. (2020). Situating vocational learning and teaching using digital technologies - A mapping review of current research literature. *International Journal for Research in Vocational Education and Training*, *7*(3), 344–360. https://doi.org/10.13152/IJRVET.7.3.5

Dornan, T., Boshuizen, H., King, N., & Scherpbier, A. (2007). Experience-based learning: A model linking the processes and outcomes of medical students' workplace learning. *Medical Education*, *41*(1), 84–91. https://doi.org/10.1111/j.1365-2929.2006.02652.x

Eichhorst, W., Rodríguez-Planas, N., Schmidl, R., & Zimmermann, K. F. (2012). *A roadmap to vocational education and training systems around the world*. Discussion Paper Series, No. 7110. Institute of Labor Economics (IZA). http://repec.iza.org/dp7110.pdf

Ellström, P.-E. (2001). Integrating learning and work: Problems and prospects. *Human Resource Development Quarterly*, *12*(4), 421. https://doi.org/10.1002/hrdq.1006

Engeström, Y. (1987/2014). *Learning by expanding: An activity-theoretical approach to developmental research*. 2nd Edition. Cambridge University Press. https://doi.org/10.1017/CBO9781139814744

Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of Education and Work*, *14*(1), 133–156. https://doi.org/10.1080/13639080020028747

Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology*, *70*(1), 113–136. https://doi.org/10.1348/000709900158001

Eraut, M. (2004). Informal learning in the workplace. Studies in Continuing Education, 26(2), 247–273. https://doi.org/10.1080/158037042000225245

Eraut, M. (2007). Learning from other people in the workplace. *Oxford Review of Education*, *33*(4), 403–422. https://doi.org/10.1080/03054980701425706

Fernández, M., & Bonilla, R. (2020). Bibliominería, datos y el proceso de toma de decisiones. *Revista Interamericana de Bibliotecología*, *43*(2), eI8/1–12. https://doi.org/10.17533/udea.rib.v43n2eI8

Finegold, D., & Soskice, D. (1988). The failure of training in Britain: Analysis and prescription. *Oxford Review of Economic Policy*, *4*(3), 21–53. https://doi.org/10.1093/oxrep/4.3.21

Fruchterman, T. M. J., & Reingold, E. M. (1991). Graph drawing by force-directed placement. *Software: Practice and Experience*, *21*(11), 1129–1164. https://doi.org/10.1002/spe.4380211102

Fuller, A., & Unwin, L. (2003). Creating a „Modern Apprenticeship": A critique of the UK's multi-sector, social inclusion approach. *Journal of Education and Work*, *16*(1), 5–25. https://doi.org/10.1080/1363908022000032867

Fuller, A., & Unwin, L. (2004). Expansive learning environments: Integrating organisational and personal development. In A. Fuller, A. Munro & H. Rainbird (Eds.), *Workplace learning in context* (pp. 126–144). Routledge. https://doi.org/10.4324/9780203571644

Fuller, A., Hodkinson, H., Hodkinson, P., & Unwin, L. (2005). Learning as peripheral participation in communities of practice: A reassessment of key concepts in workplace learning. *British Educational Research Journal*, *31*(1), 49–68. https://doi.org/10.1080/0141192052000310029

Gessler, M., & Siemer, C. (2020). Umbrella review: Methodological review of reviews published in peer-reviewed journals with a substantial focus on vocational education and training research. *International Journal for Research in Vocational Education and Training*, *7*(1), 91–125. https://doi.org/10.13152/10.13152/IJRVET.7.1.5

Greinert, W.-F. (1999). Berufsqualifizierung und dritte industrielle Revolution: Eine historisch-vergleichende Studie zur Entwicklung der klassischen Ausbildungssysteme. Nomos.

Greinert, W.-F. (2004). European vocational training systems: The theoretical context of historical development. In Cedefop (Ed.), *Towards a history of vocational education and training (VET) in Europe in a comparative perspective*. Proceedings of the first international conference October 2004, Florence, Volume I. Office for Official Publications of the European Communities (pp. 17–27). https://www.cedefop.europa.eu/files/5153_1_en.pdf

Griffiths, T., & Guile, D. (2003). A connective model of learning: The implications for work process knowledge. *European Educational Research Journal*, *2*(1), 56–73. https://doi.org/10.2304/eerj.2003.2.1.10

Guile, D., & Griffiths, T. (2001). Learning through work experience. *Journal of Education and Work*, *14*(1), 113–131. https://doi.org/10.1080/13639080020028738

Harzing, A.-W., & Alakangas, S. (2016). Google Scholar, Scopus and the Web of Science: A longitudinal and cross-disciplinary comparison. *Scientometrics*, *106*(2), 787–804. https://doi.org/10.1007/s11192-015-1798-9

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*(1), 81–112. https://doi.org/10.3102/003465430298487

Haug, E. H., Plant, P., Valdimarsdóttir, S., Bergmo-Prvulovic, I., Vuorinen, R., Lovén, A., & Vilhjálmsdóttir, G. (2019). Nordic research on educational and vocational guidance: A systematic literature review of thematic features between 2003 and 2016. *International Journal for Educational and Vocational Guidance*, *19*(2), 185–202. https://doi.org/10.1007/s10775-018-9375-4

Hodkinson, P., Biesta, G., & James, D. (2008). Understanding learning culturally: Overcoming the dualism between social and individual views of learning. *Vocations and Learning*, *1*(1), 27–47. https://doi.org/10.1007/s12186-007-9001-y

Iannelli, C., & Raffe, D. (2007). Vocational upper-secondary education and the transition from school. *European Sociological Review*, *23*(1), 49–63. https://doi.org/10.1093/esr/jcl019

Jørgensen, C. H., Olsen, O. J., Thunqvist, D. P. (Eds.), (2018). *Vocational education in the Nordic countries: Learning from diversity*. Routledge. https://doi.org/10.4324/9781315414492

Kessler, M. M. (1963). Bibliographic coupling between scientific papers. *American Documentation*, *14*(1), 10–25. https://doi.org/10.1002/asi.5090140103

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press. https://doi.org/10.1017/CBO9780511815355

Lester, S., & Costley, C. (2010). Work-based learning at higher education level: Value, practice and critique. *Studies in Higher Education*, *35*(5), 561–575. https://doi.org/10.1080/03075070903216635

López Belmonte, J., Segura-Robles, A., Moreno-Guerrero, A.-J., & Parra-González, M. E. (2020). Machine learning and big data in the impact literature. A bibliometric review with scientific mapping in Web of Science. *Symmetry*, *12*(4), 495. https://doi.org/10.3390/sym12040495

Malloch, M., Cairns, L., Evans, K., O´Connor, B. (Eds.). (2011). *The SAGE handbook of workplace learning*. Sage.

Martín-Martín, A., Thelwall, M., Orduna-Malea, E., & Delgado López-Cózar, E. (2021). Google Scholar, Microsoft Academic, Scopus, Dimensions, Web of Science, and OpenCitations' COCI: A multidisciplinary comparison of coverage via citations. *Scientometrics*, *126*(1), 871–906. https://doi.org/10.1007/s11192-020-03690-4

McGrath, S., Mulder, M., Papier, J., & Suart, R. (2019). Handbook of Vocational Education and Training: Developments in the Changing World of Work. Springer. https://doi.org/10.1007/978-3-319-94532-3

Mohammad, D. S., & Ismail, S. (2019). Comparative analysis between Nigeria and Malaysia education policies and employability skills in Tvet curriculum. *Open Journal of Science and Technology*, *2*(2), 1-5. https://doi.org/10.31580/ojst.v2i2.912

Moosa, V., & Shareefa, M. (2020). Science mapping the most-cited publications on workplace learning. *Journal of Workplace Learning*, *32*(4), 259–272. https://doi.org/10.1108/JWL-10-2019-0119

National Center for Vocational Education Research. (NCVER) (2021). VOCEDplus subjects and keywords. Updated November 2021. NCVER. https://www.voced.edu.au/sites/default/files/documents/subjects_and_keywords.pdf

Nylund, M., Rosvall, P.-Å., & Ledman, K. (2017). The vocational–academic divide in neoliberal upper secondary curricula: The Swedish case. *Journal of Education Policy*, *32*(6), 788–808. https://doi.org/10.1080/02680939.2017.1318455

OECD. (2014). *Skills beyond School: OECD Reviews of Vocational Education and Training*. OECD Publishing. https://doi.org/10.1787/9789264214682-en

Peters, M. D. J., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews: *International Journal of Evidence-Based Healthcare*, *13*(3), 141–146. https://doi.org/10.1097/XEB.0000000000000050

Pilz, M. (2016). Typologies in comparative vocational education: Existing models and a new approach. *Vocations and Learning*, *9*(3), 295–314. https://doi.org/10.1007/s12186-016-9154-7

Russell, L., Simmons, R., & Thompson, R. (2011). Ordinary lives: An ethnographic study of young people attending entry to employment programmes. *Journal of Education and Work*, *24*(5), 477–499. https://doi.org/10.1080/13639080.2011.573773

Ryan, P. (2001). The school-to-work transition: A cross-national perspective. *Journal of Economic Literature*, *39*(1), 34–92. https://doi.org/10.1257/jel.39.1.34

Schaap, H., Baartman, L., & de Bruijn, E. (2012). Students' learning processes during school-based learning and workplace learning in vocational education: A review. Vocations and Learning, 5(2), 99–117. https://doi.org/10.1007/s12186-011-9069-2

Schaap, H., Baartman, L., & de Bruijn, E. (2012). Students' learning processes during school-based learning and workplace learning in vocational education: A review. *Vocations and Learning*, *5*(2), 99–117. https://doi.org/10.1007/s12186-011-9069-2

Schön, D.A. (1983). *The reflective practitioner. How professionals think in action*. Basic Books.

Schön, D.A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. Jossey-Bass.

Schwendimann, B. A., Cattaneo, A. A. P., Dehler Zufferey, J., Gurtner, J.-L., Bétrancourt, M., & Dillenbourg, P. (2015). The 'Erfahrraum': A pedagogical model for designing educational technologies in dual vocational systems. *Journal of Vocational Education & Training*, *67*(3), 367–396. https://doi.org/10.1080/13636820.2015.1061041

Schwendimann, B. A., De Wever, B., Hämäläinen, R., & Cattaneo, A. A. P. (2018). The state-of-the-art of collaborative technologies for initial vocational education: A systematic literature review. *International Journal for Research in Vocational Education and Training*, *5*(1), 19–41. https://doi.org/10.13152/ijrvet.5.1.2

Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Educational Researcher*, *27*(2), 4–13. https://doi.org/10.3102/0013189X027002004

Small, H. (1973). Co-citation in the scientific literature: A new measure of the relationship between two documents. *Journal of the American Society for Information Science*, *24*(4), 265–269. https://doi.org/10.1002/asi.4630240406

Smith, E., & Yasukawa, K. (2017). What makes a good VET teacher? Views of Australian VET teachers and students. *International Journal of Training Research*, *15*(1), 23–40. https://doi.org/10.1080/14480220.2017.1355301

Smith, R., & O'Leary, M. (2013). New public management in an age of austerity: Knowledge and experience in further education. *Journal of Educational Administration and History*, *45*(3), 244–266. https://doi.org/10.1080/00220620.2013.796913

Taylor, A., & Freeman, S. (2011). 'Made in the trade': Youth attitudes toward apprenticeship certification. *Journal of Vocational Education & Training*, *63*(3), 345–362. https://doi.org/10.1080/13636820.2011.570455

Tonhäuser, C., & Büker, L. (2016). Determinants of transfer of training: A comprehensive literature review. *International Journal for Research in Vocational Education and Training*, *3*(2), 127–165. https://doi.org/10.13152/ijrvet.3.2.4

Tran, L. T. (2016). Mobility as 'becoming': A Bourdieuian analysis of the factors shaping international student mobility. *British Journal of Sociology of Education*, *37*(8), 1268–1289. https://doi.org/10.1080/01425692.2015.1044070

Tynjälä, P. (2008). Perspectives into learning at the workplace. *Educational Research Review*, *3*(2), 130–154. https://doi.org/10.1016/j.edurev.2007.12.001

Tynjälä, P. (2013). Toward a 3-P model of workplace learning: A literature review. *Vocations and Learning*, *6*(1), 11–36. https://doi.org/10.1007/s12186-012-9091-z

van Eck, N. J. (2011). *Methodological advances in bibliometric mapping of science* (No. EPS-2011-247-LIS). ERIM Ph.D. Series Research in Management. Erasmus Research Institute of Management. http://hdl.handle.net/1765/26509

van Eck, N. J., & Waltman, L. (2007). VOS: A new method for visualizing similarities between objects. In R. Decker & H.-J. Lenz (Eds.), *Advances in data analysis* (pp. 299–306). Springer. https://doi.org/10.1007/978-3-540-70981-7_34

van Eck, N. J., & Waltman, L. (2009). How to normalize cooccurrence data? An analysis of some well-known similarity measures. *Journal of the American Society for Information Science and Technology*, *60*(8), 1635–1651. https://doi.org/10.1002/asi.21075

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3

van Eck, N. J., & Waltman, L. (2014). Visualizing bibliometric networks. In Y. Ding, R. Rousseau & D. Wolfram (Eds.), *Measuring scholarly impact* (pp. 285–320). Springer International Publishing. https://doi.org/10.1007/978-3-319-10377-8_13

van Eck, N. J., & Waltman, L. (2020). VOSviewer manual. Universiteit Leiden. https://www.vosviewer.com/documentation/Manual_VOSviewer_1.6.15.pdf

van Eck, N. J., Waltman, L., Dekker, R., & van den Berg, J. (2010). A comparison of two techniques for bibliometric mapping: Multidimensional scaling and VOS. *Journal of the American Society for Information Science and Technology*, *61*(12), 2405–2416. https://doi.org/10.1002/asi.21421

Visser, M., van Eck, N. J., & Waltman, L. (2021). Large-scale comparison of bibliographic data sources: Scopus, Web of Science, Dimensions, Crossref, and Microsoft Academic. *Quantitative Science Studies*, *2*(1), 20–41. https://doi.org/10.1162/qss_a_00112

Waltman, L., & van Eck, N. J. (2013). A smart local moving algorithm for large-scale modularity-based community detection. *The European Physical Journal B*, *86*(11), 471. https://doi.org/10.1140/epjb/e2013-40829-0

Waltman, L., van Eck, N. J., & Noyons, E. C. M. (2010). A unified approach to mapping and clustering of bibliometric networks. *Journal of Informetrics*, *4*(4), 629–635. https://doi.org/10.1016/j.joi.2010.07.002

Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. Cambridge University Press. https://doi.org/10.1017/CBO9780511803932

Wolf, A. (2011). *Review of vocational education and training – the Wolf report*. UK Department for Business, Innovation & UK Skills and Department for Education. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/180504/DFE-00031-2011.pdf

Wolter, S. C., & Ryan, P. (2011). Apprenticeship. In E. A. Hanushek, S. Machin & L. Woessmann (Eds.), *Handbook of the economics of education* (pp. 521–576). Elsevier. https://doi.org/10.1016/B978-0-444-53429-3.00011-9

Young, M. F. D. (2008). *Bringing knowledge back in: From social constructivism to social realism in the sociology of education*. Routledge.

Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, *18*(3), 429–472. https://doi.org/10.1177/1094428114562629

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