



*Our Services » BIBB-Publications » Series » Specialist Internet articles »
As much as necessary, as little as possible!*

As much as necessary, as little as possible!

Indexing knowledge in vocational education and training research via the automated alignment of literature to projects within a knowledge management system

Sandra Dücker, Markus Linten

Published: October-30-06 URN: urn:nbn:de:0035-0193-7

Published: October-30-06 URN: urn:nbn:de:0035-0193-7

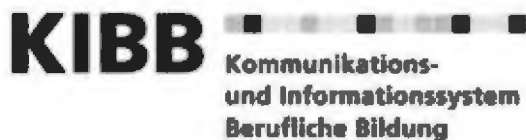


"The right information at the right time and at the right place" - in an age where information overload is becoming ever greater and the information jungle ever more impenetrable, identifying the information required at any given moment with the minimum amount of time and effort has sometimes become a task of Sisyphean proportions,

especially in light of the fact that a piece of information only turns into a valuable resource when capable of being linked in a meaningful way to other information and when guarantees are in place as to the quality of the information.

All of this means that a greater level of significance will be accorded in future to information systems, portals and databases, especially when integrated into networks. Such resources are a vital element in satisfying the demands placed on sustainable information and knowledge management at both a personal and company level.

In order to make VET research knowledge accessible to a wider circle of users and working in conjunction with the Internet editorial team of the Federal Institute for Vocational Education and Training (BIBB), the "Communication and Information System Vocational Education and Training" (KIBB) Project has developed a so-called "knowledge map"» 01, which uses a thematically structured catalogue to present German VET research issues, activities and results.



The "knowledge map" provides access to several hundred research projects and programmes via **structured documentation of the respective contents on individual project pages**. Further information on the projects and programmes is made available in a standardised form.

The "knowledge map" may be accessed online in both the www.kibb.de and www.bibb.de Internet portals, both using the same "knowledge map". Alongside the BIBB research projects and programmes, the KIBB portal also lists research results from other institutions within the "Vocational Education and Training Research Network" (AG BFN).

Alongside the manual entry of project information into the "knowledge map", an **automated process** creates a **link-up** between the latter and **various BIBB databases**. Not only does this process generate information from databases on the project pages, it also simultaneously embeds them in context in terms of their content. The following databases are currently linked up within the "knowledge map": the Literature Database for Vocational Education and Training (LDBB), the Database of Projects (DaPro) and the BIBB Pilot Project Database (MIDo).

The following focuses on the **example of the Literature Database for Vocational Education and Training (LDBB)** for the purposes of demonstrating how the collation of information takes place from systems with widely differing requirements in terms of processing of information and how such a process creates added value for users. This article will firstly present the LDBB as a documentation system, its main thematic areas and how content can be indexed before moving on to provide an explanation of the automated display of references and the ensuing added value for the "knowledge map". The final section will deal with the perspectives for and the further development of the LDBB documentation system and the information stored within the KIBB portal "knowledge map".

The KIBB portal "knowledge map" currently enables users to view LDBB references related to the project context in terms of content. After detailed scrutiny of the display results, automated

project context in terms of content. After detailed scrutiny of the display results, automated publication of references in the BIBB portal "knowledge map" is now also imminent.

1. The Literature Database for Vocational Education and Training (LDBB) as documentation system

The Literature Database for Vocational Education and Training (LDBB) currently occupies a special status within the German specialist information market.

- ▶ *The LDBB is the only VET research literature database in Germany.*
- ▶ *The LDBB is free of charge and searchable online without restriction of access.*
- ▶ *Die LDBB combines the current validity of the references it provides with high quality evaluation of largely independently produced literature, such as essays which have appeared in journals and are difficult to research via library catalogues or the Internet.*

The **LDBB currently comprises approximately 48,000 references** from 1988 onwards, providing specialist material on all aspects of the thematic areas of "vocational education and training" and "VET research". The datasets contain bibliographical information, and content may be accessed via keywords, abstracts and via a classification system. » 02

The LDBB was commissioned by the Vocational Education and Training Research Network (AG BFN) and has been operated by the Federal Institute for Vocational Education and Training (BIBB) since the beginning of the 1990's. It has been searchable online and free of charge since February 2005, the Internet version replacing the previous system of printed and CR-ROM publications. The Internet presence enables users to access the database regardless of where they are or what time it is. The LDBB Internet presence was funded for the KIBB Project by the Federal Ministry of Education and Research.

What are the main thematic areas of the LDBB?

The main content focus of the literature database is in the following ten main areas:

- ▶ *the vocational education and training system and the dual system;*
- ▶ *the training places market and the employment system;*
- ▶ *VET research;*
- ▶ *occupational and qualifications research;*
- ▶ *socio-scientific and economic foundations of vocational education and training;*
- ▶ *structure and organisation of initial and continuing vocational education and training;*
- ▶ *in-company and school-based learning;*
- ▶ *VET learning venues;*
- ▶ *groups within VET (target groups, educational staff);*
- ▶ *international vocational education and training and international VET cooperation.*

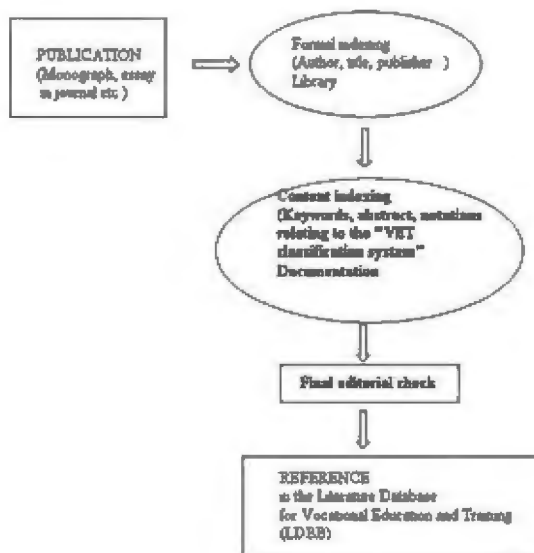
References provided by cooperation partners on the research fields of the labour

References provided by **cooperation partners** on the research fields of the labour market/occupations and adult education, expand the thematic spectrum of the LDBB. This information is supplied via the Institute for Employment Research (IAB) and the German Institute for Adult Education (DIE).

Which sources are evaluated and how can they researched?

Evaluation is undertaken of essays in periodicals, papers in edited volumes, monographs, grey literature and, to an increasing extent, Internet publications fulfilling the criteria which are deemed to render them worthy of documentation » 03. There are three search methods for conducting research in the LDBB:

- ▶ a quick search function based on that provided by the major search engines (one search field);
- ▶ a simple search function using three search fields (title, author, keyword) and
- ▶ an extended search function using a total of 12 bibliographical fields.



How is content indexed within the LDBB?



Keywords, abstracts and the vocational education and training classification system, which will be described in more detail below, serve as content indexing instruments within the LDBB.

1. Keywords

The main instrument for indexing content and therefore for conducting research is the IAB (Institute for Employment Research) and BIBB (Federal Institute for Vocational Education and Training) joint list of keywords relating to the labour market, occupations and vocational education and training » 04. The spectrum covered by the list is multidisciplinary in nature and accords particular consideration to terminology in the fields of VET research, labour market and occupational research and in the social and economic sciences.

The terminologically monitored list of keywords offers LDBB users the advantage that the semantic environment is always displayed alongside the search word and synonyms, quasi-synonyms and abbreviations can be looked for at the same time. (A search using the keyword "European Qualifications Framework" implies a search for EQF und EQR, for example). In addition to this, cross references are displayed in the form of main headings/subheadings or related keywords, acting as a navigation system to guide users through the database (in this example, a cross-reference to "crediting of prior learning", which in turn implies a search for ECTS and ECVET). In the full display of the documentation, all the publications of the author in question, all articles from the source listed, all documents relating to one of the indexed search words or all classification descriptions (notations) which have been allocated within the classification system can be accessed via a single click. » 05

Keyword "e-learning

Used for: *Electronic Learning; computer-aided learning; computer-aided teaching; Internet aided learning; multimedia learning; online learning; virtual learning*

Related terminology: *Educational technology; new media; blended learning; CBT; WBT; Internet; learning platform; learning programme; use of media; tele-teaching; tele-tutor*

Main heading: *Learning*

Fig. 2: Semantic environment for the keyword "e-learning"

2. Abstracts

Alongside the indexing of content via keywords the references are provided with an abstract (short summary of content). For those seeking information, the contents of the abstract are a major criterion in terms of personal evaluation of the relevance of a publication. The abstract gives a brief summary of the publication, the keywords it contains in turn forming the potential object of a further search via the text search function. This is a particularly useful tool when dealing with the names of projects, pilot projects or business games such as SIMBA, VISUBA, SENEKA, GEFLEX, DILO or LANF. The same applies for extremely specific terminology, such as heterotopy concept, knowledge architecture or Diderot Effect, which are not contained within the monitored keyword list.



3. Classification system

Classification Systems » **06** such as the DDC (Dewey Decimal Classification) » **07**, the most widespread universal classification system in the world, form the basis of content indexing in a whole series of databases and online library catalogues (Online Public Access Catalogues, OPAC's) and are thus also deployed for information research purposes. An example of using classification systems for content indexing is the "Classification System for Vocational Education and Training" » **08**, developed jointly by KIBB and the Technical University of Darmstadt, which enables automated networking of stored knowledge and is used within the specific LDBB link-up process on the individual project pages within the knowledge map.

What is the connection between content indexing and good research results?

The content indexing instruments described above enable more precise description of documents and thus enable them to be more readily found during the search process. The basic characteristics of a successful search result are a high level of precision and completeness. These are important information science measurements and provide information on the proportion of relevant results overall and the proportion of relevant documents found in relation to all relevant documents available within the database.

When researching information on the Internet using search engines such as Google, Yahoo and MSN from Microsoft, a number of deficits become apparent, at least in comparison with classical database research. Estimates and investigations have shown that the part of the Internet containing thematically specific databases or library catalogues not searchable via search engines (invisible web) is between 40 and 500 times bigger than the so-called visible web.» **09** A user is largely unaware of the scope, structure and quality of the data available on the Internet, the same applying to the link topological ranking procedure responsible for the supposed sorting of the list of results according to relevance. The search result is normally based on the frequency and position of the search word in the respective document found and on the frequency of links in other documents to the document appearing in the search result. Both this process and the procedure of index spamming, which has become frequent of late and involves so-called search engine optimisers altering a website in such a way so as to accord it one of the top places in the last of results, means what a user initially perceives as relevant documents is often a sham, content and authenticity not always standing up to closer inspection.» **10**

2. Automated alignment of references to projects in the KIBB knowledge map and how these are presented

Although a database research enables extensive download of information in accordance with a

Although a database research enables extensive download of information in accordance with a whole range of search criteria, there can be circumstances where a considerable amount of research knowledge is required on the part of users. Whereas searching for the author or the title of a publication is relatively simple to carry out, conducting a thematic search using keywords, headwords or the classification within the database involves a disproportionately higher level of time and trouble and possibly requires previous knowledge.

The main ways of extracting information for the "**knowledge map**" are manual entry of information on individual project pages and the extraction of information from individual databases to be displayed via an automated process. Both of these supply methods have their advantages and disadvantages.

Benefits and limits of manual and automated information alignment

When **data is entered manually**, the advantage of having high quality information related to the research topic in question and prepared by the respective expert is absolutely obvious. A disadvantage is that it is not always possible to provide timely updates of content in the course of the everyday working routine.

When **information is displayed automatically** from linked databases, the fact that information on the project page is updated simultaneously with the information stored in the database, in a timely manner and at regular intervals, needs to be viewed as an advantage. The disadvantage here is that information not best matched to the content of the project page is sometimes displayed. This is another area where an expert needs to cast a critical look from time to time. From a user's point of view, however, the benefits definitely outweigh the drawbacks, it being possible to adopt a wide orientation thematically within the context of a defined project or topic without the (initial) need to conduct independent research in the linked database.

The combination of manual data administration and automatically generated LDBB references on the project pages leads to the interlinking of the following aspects.

Benefits of automated alignment

- ▶ *The additional provision of information in the form of entries from the LDBB enables further **content orientation** extending beyond the narrow confines of the project topic.*
- ▶ *The LDBB connection establishes permanent availability of provision of current information **without necessitating additional search time on the part of the users**. The fact that new references are periodically saved also means that data stored on the project pages is continuously expanded.*
- ▶ *The specialist literature primarily evaluated for the LDBB fulfils the criteria of **current validity of information, quality and relevance**.*
- ▶ *The selected display of information, which is in contrast to the extensive search opportunities the LDBB affords, facilitates a **simple, rapid and yet comprehensive** overview of relevant publications. One of the ways in which this is supported is via a reverse chronological order sorting process, placing current references on a theme at the start of the list of results. "Results from the literature database" lists five references. "Show all" gives the entire list of results.*

The main focus of the display of the references on the project pages is "as much as necessary, as little as possible". If required, more detailed information on each individual reference can be accessed via the so-called "specific reference view" by clicking on the reference. The standardised classification and storage procedure (see section 2) enables a meaningful and reliable linking of documents, thus facilitating the establishment of an effective electronic memory.» 11

There are, however, also **limits** to the automated process described here. The provision of information is based on an alignment system (classification System)» 12 designed with a view to deploying a system of terminological matching to record data relating both to thematic areas within the VET field and to the particular aspect of vocational education and training research within a clear and straightforward system. In the same way as the updating of knowledge is rendered both more important and more difficult as the validity of such knowledge declines, the field of vocational education and training (research) is subject to a permanent process of change. The alignment system deployed for automated interlinking (initially) represents a status quo. The result of this is that the alignments sought are not always capable of implementation, the consequence being that provision of results lacks precision to a certain extent. Irrespective of this, the added value offered by automated interlinking of stored data via the provision of information suited to content is incontestable and makes sense in every way, especially in the light of individual evaluation of information made available.

The automated display of LDBB references represents an opportunity for users to undertake **an initial content related orientation**. In addition to and irrespective of this, the LDBB enables comprehensive research to be conducted at any time, enabling users to avail themselves of the multifarious search possibilities this comprises

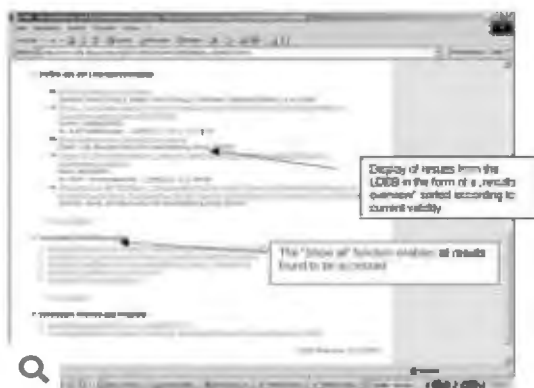


How does the automatic linking of LDBB references work?

A project page from the "knowledge map" of the KIBB Project» 13 provides an opportunity to demonstrate how the process of linking the LDBB entries on the project pages is effected. Automated linking of LDBB references with an individual project page in the "knowledge map" takes place via deployment of the **"Classification System for Vocational Education and Training"**, which also serves as an LDBB content indexing instrument.

The aim of the compilation of the classification system was the **systematisation of action fields and structures within VET research in terms of core topics and terminology** with a view to creating the conditions enabling systematic linking of existing information systems and databases. The main emphasis of this process was on the interlinking of terms, enabling the creation of a systematic terminological field rather than merely focussing on the collation of terminology per se. The classification system currently comprises around 300 definitions from the areas of vocational education and training and VET research. The reconciliation of classification definitions (notations) within an entry in the database (reference) against a project page (such as in the case of P 1.3 "Women", G1.3.2 "Educational behaviour and processes" and G 2.4.5 "Gender mainstreaming", see Fig. 4, displays the reference on the project page if a match is found. Content from the linked LDBB database system is directly and dynamically generated via an interface every time a project page is accessed.

The **"Classification System for Vocational Education and Training"** was integrated into the new BIBB library and documentation system (aDIS/BMS) as part of a transfer of all existing literature undertaken in the summer of 2004.



Presentation of results

Results from the LDBB are initially displayed in a so-called results overview, sorted according to the criterion of current validity of information. The advantage of this is that it enables a rapid general view of references to be ascertained.



More detailed information on each individual result found can be accessed via the so-called "specific reference view" (complete citation format including abstract). References to online documents are directly linked to the corresponding complete texts via the URL.

3. Forecast

Perspectives for documentation of literature: integration into external search engines, profile sharpening and an even greater degree of current validity of information

The extensive data stored in the LDBB has not thus far been searchable via search engines such as Google.» 14 Results are generated dynamically for each individual search, rendering them invisible for search engines in this form ("invisible web"). In light of the fact that such search engines as Google enjoy a high level of popularity amongst relevant LDBB target groups, particularly students » 15, plans are underway to make stored data relating to recent years of publication searchable on Google. In order to ensure the greatest possible relevance of references displayed in the results list, the aim is only to index selected fields in Google (author, title and keyword) rather than the complete data. In a similar way to on the KIBB knowledge map, a link will then be provided to www.ldbb.de, enabling users to access the effective and wide-ranging research opportunities available in the LDBB.

In accordance with the German Accessible Information Technology Ordinance (BITV) pursuant to the German Disability Discrimination Act (BGG), the entire BIBB Internet presence will be made accessible as part of the relaunch. When accessibility has been established, the references in the LDBB will be available via a fixed address (URL). This will mean that whenever a link is provided to an LBDD entry this will also be accessible via external search engines.

The LDBB is increasingly providing references to online documents » 16, these being linked to the respective full texts via the relevant URL. From the publication year of 2004 onwards, the proportion of online documents has already reached 25 percent. This means that direct access to the complete text is available for one in four searches currently carried out. For some months, BIBB documentation has also been offering selected bibliographies » 17 on current VET themes

LDBB documentation has also been offering selected bibliographies with on current VET themes, these being available online for download free of charge in the form of pdf files.

In addition to these selected bibliographies, further products will follow in the not too distant future providing rapid access to specialist publications for interested users. Alongside the existing links to the specialist pedagogical portal operated by the German Service Institute for Educational Information and Educational Research (DIPF) and the proArbeit portal at the Institute for Employment Research (IAB), plans are also in place to connect the LDBB to the interdisciplinary Internet portal for academic research information in Germany, vascoda, before the end of the year. Over 40 institutions with varying academic research interests are involved with this portal, which is jointly funded by the Federal Ministry of Education and Research (BMBF) and the German Research Foundation (DFG).

The increasing integration of the LDBB into cross-functional specialist portals opens up interdisciplinary access, enabling a greater focus to be accorded to the core areas of vocational education and training in future. The aims of this measure are to sharpen the profile of the LDBB and to achieve an even higher level of current validity of information.

Perspectives for the KIBB Portal: continuous increase in the amount of information stored whilst maintaining the same level of quality and current validity of information

Vocational education and training research is faced with the constant challenge of dealing with the central factor of the role and significance of knowledge processes. Information and communication technology has opened up new ways of shaping knowledge processes, Internet technologies in particular providing new possibilities of retrieving and structuring information and making it available to stakeholders. These processes enable the interlinking of various technical solutions, databases and other sources of data on a standardised platform in a way which remains invisible for the user. This creates the conditions for the development of innovative information and documentation systems which can fulfil extremely specific specialist requirements whilst also being capable of integration into multi-disciplinary portals.» 18

The linking of databases, described in the present article via the example of a literature database, will enable the information stored in the "knowledge map" to be continuously expanded. The integration of the database information into the context of a project within the field of vocational education and training facilitates the establishment of a **unique selling proposition in qualitative terms** with regard to the breadth of information available. The incontestable benefit lies in the opportunity to exploit the advantages provided by a well-maintained database in terms of quality, academic research credibility and current validity of data stored. This generates synergies in that although data administration only needs to be carried out at a single point, the data may be subsequently evaluated in a wide range of different systems.

Plans are in place for the imminent connection of a further database on the topic of school-based pilot projects for the "knowledge map" in the KIBB Portal.

Literature

Sources:

- Diepold, Peter; Ziegler, Heinz
Literaturdokumentation Berufliche Bildung : Expertise im Auftrag des Bundesministers für Bildung und Wissenschaft - (Literature documentation on vocational education and training: a survey commissioned by the Federal Ministry of Education and Science) Göttingen, 1993.
[German language resource]

- ▶ Dücker, Sandra; Kuehn, Bernd; Schapfel-Kaiser, Franz
The transition from information to knowledge - The making of a BIBB knowledge map - Status:
 11 July 2005 - Bonn: Federal Institute for Vocational Education and Training, 2003 - English
 version <http://www.bibb.de/en/8167.htm> [accessed: 5 October 2006]
- ▶ Gödert, Winfried
Klassifikationssysteme und Online-Katalog - In: Zeitschrift für Bibliothekswesen und Bibliographie (Classification systems and online catalogue - in the Periodical for Librarianship and Bibliography) 34 (1987) 3, pp. 185-195 [German language resource]
- ▶ Hoffmann, Matthias
Die Nadel im Heuhaufen finden - und das mit einem Griff? - In: Wissensmanagement (Finding a needle in a haystack - at the first attempt? - in Knowledge management) (2006) 4, pp. 14-15
 [German language resource]
- ▶ Kurhula, Päivikki
Use and usability of the UDC in classification practice and online retrieval. - In: The UDC - essays for a new decade - London: Aslib, 1990, pp. 35-46
- ▶ Lewandowski, Dirk
Web information retrieval: Technologien zur Informationssuche im Internet. Frankfurt/Main: Deutsche Gesellschaft für Informationswissenschaften und Informationspraxis (Technologies for the search for information in the Internet - Frankfurt am Main: German Association for Information Science and Practice) 2005 [German language resource]
- ▶ Linten, Markus
OPAC ETHICS: der Online-Publikumskatalog der ETH Zürich (The online public catalogue of the Swiss Federal Institute of Technology in Zurich) Erndtebrück, 1991 [German language resource]
- ▶ Pawlowsky, Peter; Reinhardt, Rüdiger
Wissensmanagement für die Praxis: Methoden und Instrumente zur erfolgreichen Umsetzung -
 (Knowledge Management for practice: methods and instruments for successful implementation) Neuwied / Kriftel, 2002 [German language resource]
- ▶ Probst, Gilbert; Raub, Steffen; Romhardt, Kai
Wissen managen: wie Unternehmen ihre wertvollste Ressource optimal nutzen (Managing knowledge: how companies make the best possible use of their most valuable resource) - 3rd edition, Wiesbaden: Gabler, 1999 [German language resource]
- ▶ Roehl, Heiko
Organisationen des Wissens: Anleitung zur Gestaltung (Organisation of knowledge: a structural guide) Stuttgart: Klett-Cotta, 2002 [German language resource]
- ▶ Schapfel-Kaiser, Franz
Klassifizierungssystem der beruflichen Bildung: Entwicklung, Umsetzung und Erläuterungen
 (Classification System for Vocational Education and Training: development, implementation and explanations) - Bielefeld: Bertelsmann, 2005 [German language resource]
- ▶ Semenova, Elena
Dokumentationssprache - ja oder nein. -In: Information Wissenschaft und Praxis
 (Documentation language - yes or no - in: Information Research and Practice) 57 (2006) 3, pp. 157-161 [German language resource]
- ▶ Tochtermann, Klaus; Granitzer, Michael
Wissenserschließung : Pfade durch den Informationsdschungel - In: Wissensmanagement
 (Indexing knowledge: pathways through the information jungle - in Knowledge Management) (2005) 5, pp. 26-28 [German language resource]

-
- 1 See also the editorial on the BIBB website: Bernd Kuehn, Franz Schapfel-Kaiser, Sandra Dücker: "The transition from information to knowledge - The making of a BIBB knowledge map" -<http://www.bibb.de/en/8167.htm> [accessed 2 October 2006]
 - 2 The "Classification System for Vocational Education and Training" is indicated here.
 - 3 Criteria rendering them worthy of documentation can include: relevance, quality, current validity of information, academic research credibility and novelty.
 - 4 Schlagwortliste Arbeitsmarkt, Beruf und Berufsbildung: Arbeitsgrundlage für die Dokumentationsdatenbanken des Instituts für Arbeitsmarkt- und Berufsforschung und des Bundesinstituts für Berufsbildung / Institut für Arbeitsmarkt- und Berufsforschung. Band 1: Alphabetischer Teil, Band 2: Systematischer Teil (List of keywords for the labour market and vocational education and training: a working basis for the documentation databases of the Institute for Employment Research (IAB) and the Federal Institute for Vocational Education and Training (BIBB) / Institute for Employment Research. Volume 1: alphabetical part, Volume 2: systematic part) 2003 edition, Nuremberg 2003 [German language resource]
 - 5 So-called relevance feedback procedure, cf. Google function "Similar pages".
 - 6 These normally comprise alphanumeric classification definitions (notations), which also achieve increasing specification of data via increasing length of notation. Complex data which is by its very nature difficult to verbalise can be rapidly and effectively researched using a notation. An example of this is the search in the LDBB using the notation L 4.2.3 ("Internet based learning/e-learning"), under which a wide range of keywords closely related semantically are subsumed.
 - 7 Cf.  <http://www.ddc-deutsch.de> [accessed 2 October 2006] [German language resource]
 - 8  <http://www2.bibb.de/tools/klassifikationssystem/downloads/050613-Endversion-Schlüssel-FSK.pdf> [accessed: 2 October 2006] [German language resource]
 - 9 Cf. Michael K. Bergman: The Deep Web: Surfacing Hidden Value. In: Journal of Electronic Publishing. 2001. URL:  <http://www.press.umich.edu/jep/07-01/bergman.html> [Accessed: 7 September 2006]
 - 10 Internet searches using search engines are also rendered more difficult by dint of the fact that synonyms are not taken into consideration, In contrast to such systems as the LDBB, a user would have to link all definitions with a similar or identical meaning to the search term in an "or search" whilst also excluding multiple meanings (polysemy). An additional factor is possible deviations in the search term due to plurals, inflexions, spelling or in terms of the terminological concept (an example of the last mentioned being the use of the term "dual system" in both the waste management industry and vocational education and training).
 - 11 Cf.: Probst, Gilbert; Raub, Steffen; Romhardt, Kai: Wissen managen. Wie Unternehmen ihre wertvollste Ressource optimal nutzen (Managing knowledge: how companies make the best possible use of their most valuable resource) - 3rd edition, Wiesbaden: Gabler, 1999 pp. 314 ff. [German language resource]
 - 12 This article provides a more detailed explanation of the alignment system under the designation of the "Classification System for Vocational Education and Training"
 - 13 By establishing an Internet portal, www.kibb.de, which has been operating since the end of 2002 with funding from the Federal Ministry of Education and Research (BMBF), the functions of this project include the provision of documentation of available knowledge relating to VET research and of the first opportunity to access such knowledge centrally. The initial stage involved the presentation and structuring of the body of knowledge available to the Federal Institute of Vocational Education and Training (BIBB) via the development of a so-called knowledge map representing a topographical representation of knowledge, this "knowledge map" being successively expanded in the course of ongoing projects undertaken by the Vocational Education and Training Research Network (AG BFN). There are currently around 800 researchable VET research project presentations in the portal.
 - 14 LDBB references elicited via search engines are only available in the literature information provided in the pages of the KIBB knowledge map and in the German Education Portal

(English Homepage  http://www.fachportal-paedagogik.de/start_e.html).

- 15 According to the SteFi-Studie conducted in 2001, 64.1% of students used commercial search engines to search for specialist electronic information, mostly achieving a poor rate of success. Only one in ten students uses fee charging electronic research services in specialist databases, although these provide academic information which has been checked and is of high quality.
- 16 The number of publications available online is continually on the increase. The types of publication or documents are completely heterogeneous in nature (purely net publications such as monographs or periodicals, print publications which appear online either simultaneously or at a later date, grey literature and so forth). Cf. here: Woll, Christian: Wissenschaftliches Publizieren im digitalen Zeitalter und die Rolle der Bibliotheken (Academic publishing in the digital age and the role of libraries) - Cologne, 2005.
URL:  <http://www.fbi.fh-koeln.de/institut/papers/kabi/volltexte/Band046.pdf> [Accessed: 2 October 2006] [German language resource]
- 17 Selected bibliographies status 2006: Young people from a migrant background; Transitions: young people at the first and second threshold; Support for disadvantaged young people; The European Vocational Education and Training area; VET in commercial occupations; Sustainability in vocational education and training.
URL: <http://www.bibb.de/de/wlk8002.htm> [Accessed: 5 October 2006] [German language resource]
- 18 See Mittelfristiges Forschungsprogramm 2005 des Bundesinstituts für Berufsbildung (Medium term research programme 2005 of the Federal Institute for Vocational Education and Training) / Federal Institute for Vocational Education and Training (Ed.) - Bonn: Federal Institute for Vocational Education and Training, 2005.
URL:
 http://www.bibb.de/dokumente/pdf/a11_mittelfristiges-forschungsprogramm-2005.pdf [Accessed: 2 October 2006] [German language resource]

Erscheinungsdatum, Hinweis Deutsche Nationalbibliothek

Publication on the Internet: October-30-06

URN: urn:nbn:de:0035-0193-7

Deutsche Nationalbibliothek has archived the electronic publication "As much as necessary, as little as possible!", which is now permanently available on the  **archive server of Deutsche Nationalbibliothek.**

Creative Commons-Lizenz



Content on this page is licensed under the  **Creative Commons License** "Attribution: Noncommercial-No Derivative Works 3.0 Germany". Further information on this is available on our » **Creative Commons page (de).**

The Federal Institute for Vocational Education and Training is an independent federal institution established under public law.