

A VIRTUAL NATIONAL LIBRARY OF EDUCATION? GERMAN LIBRARIES COOPERATE TO SUPPORT EDUCATION*

By Diann Rusch-Feja

I. Historical Overview

After the Second World War, the educational system and libraries as cultural bastions went through total de-nazification and many structural reforms. By the early sixties, these reforms were finally being enacted after first absolving the long reconstruction period. Consequently, libraries and educational institutions were increasingly aware of the lack of bibliographical instruments for German educational literature and materials, as well as the deficiencies of various collections. Educational research institutions which had been instrumental in designing the recommendations for the educational reform, such as the German Institute for International Educational Research, the Max Planck Institute for Educational Research, and the Friedrich Eckart Institute for Textbook Research had built up major research collections, while certain state school authorities and teacher training institutions were building up collections of curricula, lesson plans, state educational requirements, and teaching materials. Since the political policy leading to World War II in Germany had had such repercussions and left such scars in the educational, cultural, and library landscape, a policy of exclusively decentralized institutions serving educational institutions and facilities including libraries was established and has been maintained since then. Furthermore, opportunities for sharing the benefits of these key collections, due to the diversity and diverse policies of the libraries concerning their holdings, interlibrary loan was extremely limited and often one had no idea where to conduct a bibliographic search for a specific item, much less determine how or where to obtain the needed educational resources.

Documentation Ring for Educational Bibliography

To overcome this lack of bibliographic access, the documentation units and libraries of eight educational research institutions began a cooperative effort in 1964 to coordinate collection and publication of the bibliographic information on

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educational resources in Germany. These eight documentation units and libraries¹ chose the name "Dokumentationsring Pädagogik" (Documentation Ring for Pedagogics), best known as "DOPAED". Despite working with at least six different data formats and four different sets of cataloging rules, DOPAED produced the first volume of the *Bibliographie Pädagogik* ("Educational Bibliography")² in 1966. This volume listed all newly registered titles of books and journal articles in the German language area including Austria and Switzerland for the year 1964. The basis for indexing the books and articles (excluding lesson plans, textbooks, curricula listings, etc.), was first according to the individual indexing needs of the individual institutions. However, efforts were made to establish a common set of terms and thus the *Thesaurus Pädagogik*³ was developed in the early Seventies. The *Thesaurus Pädagogik* combines verbal descriptors with a classification scheme especially created for the *Bibliographie Pädagogik* and based on the reformed German educational system.

Development of Subject Information Systems and Special Information Services

In the early 1970's, within the overall plan for bibliographic information centers from the German Federal Ministry of Research and Technology, an Information Center for the Education ("Fachinformationszentrum Bildung") was one of 20 such information centers originally planned in the Federal Republic of Germany. Of the 20 information centers proposed in the "Programm der Bundesregierung zur Förderung der Information und Dokumentation (IuD-Programm) 1974-1977", published in 1976, sixteen were established, with the "Information Center for Education" being one of those which was not funded.

During the 1970's and 1980's - years which can be characterized in Germany as furthering subject-oriented databases and services - DOPAED attracted new members in the Federal Republic of Germany. Despite its voluntary nature with no outside funding, it grew to 27 members in the 1980's. Also during the 1970's

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- 1 Cybernetics Linguistics Research Center (Sprachkybernetisches Forschungszentrum Heidelberg, SFZ), German Institute for International Educational Research (Deutsches Institut für Internationale Pädagogische Forschung, DIPF), German Institute for Research on Youth (Deutsches Jugendinstitut, DJI) in Munich, International Central Institut for Youth and Educational Television (Internationales Zentralinstitut für das Jugend- und Bildungsfernsehen, IZI) in Munich, Max Planck Institute for Human Development and Education (Max-Planck-Institut für Bildungsforschung, MPIB) in Berlin, Pedagogical Center (Pädagogisches Zentrum, PZ) in West Berlin (since 1995 the Berlin Institute for Continuing Education for Teachers and School Development, BILS), Standing Conference of the State Ministries of Culture (Ständige Konferenz der Kultusminister der Länder, KMK) in Bonn, UNESCO Institute for Pedagogics (UNESCO Institut für Pädagogik, UNIP) in Hamburg,
 - 2 *Bibliographie Pädagogik - Educational Bibliography*. Ed. Dokumentationsring Pädagogik (DOPAED). Munich, New York, London, Paris: Saur, 1964 ff.
 - 3 Hans H. Strater: *Thesaurus Pädagogik*. Unter Mitarbeit von Doris Friedrich. Hrsg. v. Dokumentationsring Pädagogik (DOPAED), Pullach bei München: Verlag Dokumentation, 1973.

and 1980's, librarians responsible for education-related collections in university libraries and teacher training colleges formed a working group ("Subject Specialists in Education"). Individual attempts, such as that of Heiner Schmidt⁴ to document journal literature in the field of education were made and developed parallel to DOPAED. In the 1980's, teacher training colleges were integrated into the German university system. Their libraries were integrated into the interlibrary loan network, which, however, due to different bibliographic systems was predominantly limited to bibliographic access within a particular German state. Because of these rather voluntarily organized bibliographic access means within the field of education, dissatisfaction grew among researchers, instructors, students in teacher training, and librarians serving them.

Impacts of Reunification of Germany

Reunification in 1989 stimulated major structural changes which also had a positive impact on the coordination of bibliographic access and availability of educational resources in Germany. Major political decisions were made from December 1989 throughout 1990 to dissolve many of the former GDR institutions for educational research - especially "central" institutions such as the State Institute for Higher Education Research ("Zentralinstitut für Hochschulforschung"). Other major GDR educational libraries, such as the library and archives of the GDR Academy of the Pedagogical Sciences (APW), were integrated into existing, most often West German parallel institutions. Thus, the central library of the GDR APW, a sort of national education library for the former GDR, was annexed to the German Institute for International Educational Research in Frankfurt, although it kept its operating location in Berlin.

4 Some of his works include: Schmidt, H./Lützenkirchen, F. J. (Comp.): *Erziehungswissenschaftliche Dokumentation. Reihe A: Der Inhalt neuerer pädagogischer Zeitschriften und Serien im deutschen Sprachgebiet. Zeitschriften-Nachweis 1947-1967.* – [various editions] Vols. 1-12. – Weinheim: Beltz 1969-1970; Schmidt, H. (Comp.): *Erziehungswissenschaftliche Dokumentation. Reihe B: Monographien. Hochschulschriften, selbständige und unselbständige Bibliographien. Beiträge aus Sammelwerken, Fachlexiken und Handbüchern der neueren Pädagogik im deutschen Sprachgebiet.* – Vols. 1.1945-12.1971/72. – Weinheim: Beltz 1973-1975 Schmidt, H. (Comp.): *Pädagogischer Jahresbericht. Ständige Auswertung erziehungswissenschaftlicher und fachdidaktischer Zeitschriften des deutschen Sprachgebietes (1972ff.: ... Zeitschriften, Sammelwerken und Monographien des deutschen Sprachgebietes).* – Vols. 1.1968-15.1982. – Weinheim: Beltz 1968-1982; Schmidt, H. [et al.] (Eds.): *BIB-Report. Bibliographischer Index Bildungswissenschaft und Schulwirklichkeit.* – Monatsberichte. German education index. – Vols. 1-20. – Duisburg 1974-1993; Schmidt, H. [et al.] (Comp.): *ADIEU. Auswahldienst: Informationen für Erziehung und Unterricht: Zugleich Titelkompilation und Gesamtindex zum BIB-Report.* – 1976-1990. – Duisburg: Verl. f. päd. Dokumentation 1977-1991; Schmidt, H. (Comp.): *Zentralblatt für Erziehungswissenschaft und Schule (ZEUS). Nachfolgeorgan des "Pädagogischen Jahresberichts".* – Duisburg: Verl. f. päd. Dokumentation 1985-1994.

The increased awareness for improving access to educational materials is also evident in the creation of a university chair for Pedagogical Informatics at the Humboldt University in former East Berlin. Professor Dr. Peter Diepold was called to this chair in 1994 and has since built up the curriculum for an important degree program in the use of computers in education, as well as instigating other services to education as delineated below. Attempts to capture the effects of the transition from Communism to democracy in the schools were highlighted in some educational research institutions. But the actual transition within the schools was carried out - parallel to that of denazification after the Second World War - basically without an overall evaluation of the educational goals and structures in educational institutions in Germany. The West German educational system - as also in other areas of administrative government and cultural infrastructure⁵ - was incorporated in the new German states of the former GDR. At the same time, the difficulties of integrating former GDR libraries into their West German counterparts were becoming apparent. The former GDR bibliographic databases for educational resources, collected according to instructional level, were preliminarily set aside, since they were deemed too selective (having been selected under the Communist regime criteria) to be useful. Despite this aspect of politically-influenced acquisition policy, these libraries augmented the collections in existing corresponding educational research libraries in the former West Germany and could not be left out of consideration in an educational resources network.

Because of the integration of former GDR libraries into member institutions of DOPAED, considerations were made to integrate the databases of their holdings into the *Bibliographie Pädagogik*. By 1992, DOPAED was composed of the documentation units and libraries of 23 educational institutions (see geographical distribution of the DOPAED members in 1992). The additional institutions represent government and state educational support institutions, as well as other educational research institutions.

Transition and Dissolution of DOPAED

By 1991, production of the *Bibliographie Pädagogik* had accumulated a four-year publication delay. Because of the new members and because of integrating new library automated systems, title data for the production database had to now be converted from eight different data formats and almost as many cataloging formats. This slowed production immensely. The number of subscriptions to the

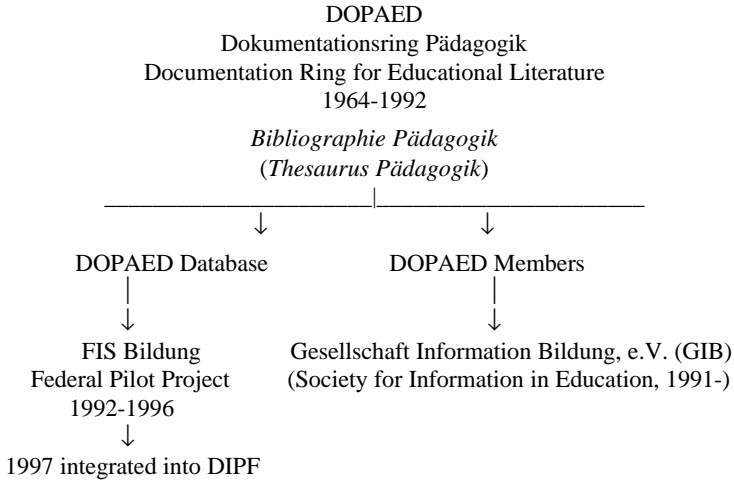
5 See Claudia Lux: Problems Creating a New Identity in East German Libraries. IFLA Management and Marketing Workshop. Meeting 157, 20 August 1998, Amsterdam. IFLA Paper Number 140-157-E (abbreviated version in German 140-157-G).

Bibliographie Pädagogik was not high enough that the publisher was interested in making additional investments in new technology or expanded editorial costs.

At the end of 1991, the Federal German government announced combined Federal and State (of Hesse) funding for a pilot project to establish a subject-oriented information center for educational literature. The pilot project was to be based on the voluntarily assembled data collection of the unofficial DOPAED group which up to this time had had no financial support other than the work capacity of the institutions involved. The voluntary data collection, then housed at the Library of the German Institute for International Educational Research (DIPF), was assumed by the government proposal as the basis for the new Coordinating Office for Educational Literature ("Fachinformationssystem Bildung" or "FIS-Bildung") without recognition of the rights of the voluntary institutions. At this time, the members of DOPAED had not been consulted or directly informed of this decision. As the announcement regarding funding and organization of a "FIS-Bildung" (similar to the subject-oriented information centers "FIZ" in the sixties) in 1991 filtered down to the contributing institutions of the DOPAED Ring, the *Bibliographie Pädagogik* for works published in 1987 was just being published. CHECK Without financial means, the fundamental problems for data conversion and means to speed up publication, desires for using a different format could not be solved. Furthermore, because of the voluntary nature of the DOPAED Ring with its high number of small specialized libraries and information centers, achieving standards for indexing, cataloging and terminological aspects had become impossible.

When the announcement of the pilot project "FIS-Bildung" was made known to the DOPAED institutions, a meeting was called in November 1991 with invited experts in the educational research field who were familiar with databases in educational literature. Because at first, the DOPAED members felt threatened by the new organizational structure and plans to subsume the DOPAED database, a non-profit society was founded to represent the interests of those institutions which had contributed to the DOPAED database and to advance better documentation of educational literature resources. This was the association "Gesellschaft Information Bildung (GIB) (Society for Information in Education) which included not only most of the former DOPAED institutions, but also several educational researchers, publishers of electronic media in the educational fields, as well as librarians and documentalists in educational libraries and documentation centers. Thus the development of the persons and institutions involved in DOPAED and the data input for the *Bibliographie Pädagogik* can be summarized as follows:

Fig. 1



After a transitional year (1992), DOPAED was dissolved with the members voting to commission the GIB with continued representation of their interests in the FIS-Bildung database and for the sales profits of the print volumes of the *Bibliographie Pädagogik*

Gesellschaft Information Bildung - Society for Information in Education

The German Society for Information in Education (Gesellschaft Information Bildung - GIB) was founded by eight of the former members of the DOPAED Ring together with several active educational researchers to improve the quality and dissemination of information on educational materials and research results, thereby also and thus improving access to them. The group had a special interest in furthering access to electronic information and in establishing quality electronic publications. The GIB supports the work of FIS-Bildung, as well as that of other educational research institutions and producers of databases and educational servers. The concept for the German Educational Resources Server originated in this group and it has given continued active support for this project. The GIB holds annual conferences, focussing on the improvement of quality indexing, thesaurus questions, and access to bibliographic and full-text materials relevant to educational research, educational policy, and various other aspects of education. (For proceedings and other information, see <http://www.educat.hu-berlin.de/gib/>)

II. The Subject Information System for Education: Fachinformationssystem Bildung "FIS-Bildung"

The "Fachinformationssystem Bildung" started as a federal pilot project for the duration of three years 1992-1995. In 1995, funding was renewed for an additional year. The pilot project was financed in equal parts by the Federal Ministry of Research and Technology (BMBF) and the State Ministry of Education of the State of Hesse.⁶ Thus, FIS-Bildung was conceived of as a coordinating unit for continuing the bibliographic indexing of educational materials started by DOPAED (*Bibliographie Pädagogik*). The fact that this was a subject-information system as opposed to a subject information center ("FIZ"), indicates its placement within the decentralized state-level authority for educational matters. Its foremost goal and function as a federal-state funded pilot project was to gather bibliographic data on educational materials to produce a comprehensive German language bibliography of educational materials and research results in a database to be produced on a CD-ROM which could be cumulated annually. Representatives of the state authorities for educational policy did not originally want to have FIS-Bildung host an online database, such as those which had developed out of the 1974 "Fachinformationsprogramm" in other subject areas. However, by the late nineties, this attitude has changed.

Originally, the FIS-Bildung pilot project was not to perform indexing tasks directly. The staff allowance was for a director, a documentalist and 1,5 positions for database construction and data conversion. This meant that from the very beginning, data input for FIS-Bildung was still dependent on the principle of voluntary submission maintained by the former DOPAED Ring. Hence, contractual agreements were offered to the former DOPAED members to submit their bibliographic data for the production of a CD-ROM with the remuneration of receiving the CD-ROM annually at no charge. Thus, FIS-Bildung began with 12 contributors. In 1994, a project group "Subject Information in Education" ("Projektgruppe Fachinformation Bildung") sponsored by the German Research Foundation began converting the former GDR database on higher education materials and joined the group of contributors. Upon completion, this database was integrated into the FIS-Bildung database in 1996. In 1995, the former GDR bibliographic database for primary and secondary school education was converted by the FIS-Bildung staff and integrated into the data collection. In the process of this cooperation with contributors of education databases of the former GDR, the

6 The location of both FIS-Bildung and DIPF is Frankfurt am Main. This is the capital city of Hesse. Frankfurt was also the site of the "Fachinformationszentrum FIZ" for Education proposed in the late sixties, but this "FIZ" was never established.

most relevant parts of historical bibliographic data could be implemented into the FIS-Bildung database. By the end of 1997, twenty-one institutions from both the "old" and the "new" German states ("new" in the sense of the former GDR) had joined the contributors' group to FIS-Bildung.

After FIS-Bildung started in 1992, contracts with the individual participating institutions including many former DOPAED institutions established continuity in the production of the *Bibliographie Pädagogik* and delivery of their title entries for the database were made to FIS-Bildung. Those agreeing to support FIS-Bildung in a manner similar to the previous support of DOPAED with submission of title entries were integrated as "Herausgeber" - thus being recognized collectively as partial owners and publishers of the *Bibliographie Pädagogik* and the FIS-Bildung database for the production of the future CD-ROM.

Originally seen as a by-product of compiling the CD-ROM database, production of the printed *Bibliographie Pädagogik* (as of the volume covering the publication year 1988 ff.) was to take place parallel to the CD-ROM production. Thus, the original database supplied by the voluntary contributing institutions would then serve not only as the basis for starting FIS-Bildung and also continuing the *Bibliographie Pädagogik*, but also for the production of an electronic, searchable version of the complete database of all German-language educational materials on CD-ROM ("CD-Bildung") from 1964 to the present which had previously been indexed only on an annual basis in the *Bibliographie Pädagogik*.

To produce the CD-ROM "CD-Bildung", the entire DOPAED database had to be converted to a database format which could be searched electronically. Conversion formats were developed for conversion of the 12 different formats of the contributor's data in various formats. In 1994-95, the database of the former GDR public grade school and secondary school educational literature database was converted and integrated into the FIS-Bildung database. From 1995-1996, the database of the former GDR higher educational bibliography was converted and integrated into the CD-Bildung database. Later in 1997, an extensive thesaurus maintenance module was integrated so as to distinguish local subject headings from those taken from the *Thesaurus Pädagogik* developed by DOPAED. Bibliographic and indexing guidelines were developed by a task force which has led to efforts to revise the *Thesaurus Pädagogik* and corresponding classification scheme. Refinement of the German Educational Thesaurus and Classification System (*Thesaurus Pädagogik*) is an ongoing, dynamic process which has been supported by several workshops sponsored by FIS-Bildung and the Society for Information in Education (GIB).

The first edition of the CD-Bildung came onto the market in 1994 and supplied bibliographic coverage for works published from 1980-1993. By the fourth edition in 1997, 341,928 title entries were indexed, of which 10 % were English (15 % were non-German including English) and 26.3 % had abstracts. By the 5th edition published in August 1998 with a total of 375,775 indexed titles, 13.4 % were English titles (with 18.4 % being non-German including English). The percentage of entries with abstracts rose to 28.7 %, and in general the quality of the abstracts rose as well. Figure 2 shows the development over the five editions produced by FIS-Bildung.

Fig. 2

CD BILDUNG⁷

Number of Title Entries	1st Ed. 1994	2nd Ed. 1995	3rd Ed. 1996	4th Ed. 1997	5th Ed 1998
Total	213.964	244.261	303.631	341.928	375.775
English language	24.521	30.482	38.889	46.305	50.467
Non-German	35.152	42.050	59.313	66.393	69.517
With Abstracts	26.495	38.680	74.244	89.895	107.732
Percentage with Abstracts	12,4%	15,8%	24,4%	26,3%	28,7%

⁷ Data for both graphs in Fig. 2 and Fig. 3 were provided by Alexander Botte, FIS-Bildung, Frankfurt, Germany.

Figure 3 shows the distribution of educational level of materials, as well as major area of focus as it has developed over the last five years.

Fig. 3

CD BILDUNG - Analysis by Subject Area

Subject Area	1st Ed. 1994	2nd Ed. 1995	3rd Ed. 1995	4th Ed. 1997	5th Ed. 1998
Educational Research	6.641	7.905	9.475	9.745	11.518
Higher Education, University Studies	12.555	16.735	23.346	27.384	30.542
Continuing Education*, Adult Education	21.421	23.935	26.760	29.470	32.164
School, Pupils, Teachers, Instruction	51.816	73.542	103.037	116.907	129.979
History of Education	638	1.573	4.923	6.989	9.053
Media	2.433	3.154	4.417	4.940	8.930
Youth Education, Working with Youth, Social Work	4.835	5.107	5.588	7.160	10.001
Vocational Training, Vocational School	9.676	16.925	21.361	24.901	29.607

Holdings information include an abbreviation of the holding institution(s) and in the case of journals, the exact volume and year with a note about use restrictions of the individual institutions. This allows direct ordering on a bilateral level, or via the interlibrary loan network. In 1998, 21 institutions contributed bibliographic data to FIS-Bildung for the production of the CD-Bildung, including insitutions from Austria and Switzerland. Annual additions range from 30,000 to 60,000 title entries.

Distribution of the member institutions shows wide coverage with 3 libraries of educational research institutions, the special subject library for education, special educational documentation centers for specific aspects of subject institutions, the documentation centers of many of the state educational agencies, and various state and national educational agencies. This provides a good cross-section of secondary literature on education and educational research, curricula in the various German states, project reports and innovation, teaching materials and a wide coverage of educational journals. FIS-Bildung discontinued the former DOPAED tradition which only indexed German-language materials. Since the 1993 data, FIS-Bildung has encouraged submission of all new title entries in the

member institutions. 650 educational journals are evaluated systematically and indexed cover-to-cover. About 100 additional educational journals held in these libraries and documentation centers are evaluated and indexed selectively. Since early 1998, FIS-Bildung offers updates to the current edition of the CD-Bildung on a continuous basis at the DIPF website: <<http://www.dipf.de/lars/lars/html/start.htm>>.

The FIS-Bildung pilot project phase ended on December 31, 1996, and since January 1, 1997, FIS-Bildung has been fully integrated into the German Institute for International Educational Research (DIPF) as one of the Service Units. In addition to its bibliographic database, FIS-Bildung is building up an Internet database for providing information on international educational Systems (INES) (<<http://www.dipf.de/>>)

Special Subject Library for Education and other Special Libraries for Education

One of FIS-Bildung members submitting a large amount of bibliographic data is the special subject library for education at the University of Nuremberg-Erlangen. This library has been supported since the mid 70's by the German Research Foundation (DFG) to enable it to afford a quality range of foreign titles relevant to this subject areas. This funding program is part of the DFG Special Subject Libraries' Program ("Sondersammelgebietsprogramm") which provides special funds for foreign resaerch literature, especially journals, at ca. 24 German university libraries according to special subject areas represented by these libraries. Other contributing members are the German Institute for International Educational Research including all of its libraries and documentation center, the Max Planck Institute for Human Development, the Bavarian State Institute for Educational Research, the state educational agencies of the State of Hesse, the State of Northrhein-Wesphalia, etc. As of 1997, the database for vocational education coordinated by the Federal Institute for Vocational Education in Berlin has been integrated into the CD-Bildung. Thus, the FIS-Bildung database was developed into a well-structured comprehensive bibliographic database for educational works published in Germany, Austria, and Switzerland, and for selective other language resources on the basis of their usefulness in research institutions and libraries in Germany, Austria and Switzerland.

III. Building the German Educational Network

This development shows how libraries and documentation units of smaller educational research and coordinating institutions cooperated to fill the glaring lack of a national educational information center and a national library of education in Germany. These bibliographic services are supported by the interlibrary loan system within the country, and this system has also seen

substantial improvement over the last 2-3 years. Since 1994, the impact of networked collections of information sources has been recognized within the German educational field. Within new considerations of expanding the information infrastructure, the Federal Ministry of Education, Science, Technology and Research looked at the possibilities of integrating all networked information resources into the existing subject information programs. In this context, several new developments took place which contributed to creating a better information infrastructure for educational materials.

The German Educational Resources Server

In 1995 at the annual meeting of the German Society for Information in Education (Gesellschaft Information Bildung - GIB), a suggestion for a nationwide educational resources server with distributed input was made.⁸ This suggestion for an encompassing World Wide Web Server listing publications, teaching and learning materials, connecting them with directories of teachers, schools, educational researchers, university departments, etc., involved in education was then worked into a proposal by Professor Peter Diepold of the Department of Pedagogical Informatics of the Humboldt University of Berlin to the German Research Network Association (DFN - Deutsches Forschungsnetz - Verein). Less than six months of presentation of the idea in the GIB-Conference, the Server concept was granted three years of funding and Prof. Diepold chose the German language name "Deutscher Bildungs-Server (DBS)".⁹ On its English pages, the website is called the "German Educational Resources Server (GER)" (<<http://dbs.schule.de>>). The goals¹⁰ of this educational server are:

To serve as a central entry point for communication and information in the field of educational within the rapidly developing German educational network,

To put educational information into a transparent infrastructure,

To use synergies, and

To make this information accessible to educators and the general public.

8 Diann Rusch-Feja: German Educational Resources: Eine Sammelstelle für deutsche Erziehungswissenschaftliche und bildungsbezogene Quellen im Internet. In: *Information in Bildungswesen - Zugriff, Verfügbarkeit und Qualität. 3. GIB-Fachtagung, 22-23. November 1995 in Soest*. Eds. D. Rusch-Feja, P. Diepold, B. Christopher. Berlin: Gesellschaft Information Bildung, 1996, pp. 147-153.

9 Peter Diepold: Bildungswesen im Internet. Entwicklung des Deutschen Bildungs-Servers. In: A. Botte, D. Rusch-Feja, B. Christopher (Eds.): *Implikationen der Informationsgesellschaft für die Bildung. 4. GIB-Fachtagung, 10.-11. Oktober 1996 in Berlin*. Berlin: Gesellschaft Information Bildung, 1997, pp. 47-67.

10 See <<http://dbs.schule.de/dbse.html>>

Additional goals emphasize educating the users in ethical use of information and communicating with others, and to link the German educational network to educational resource management systems of other countries.

This Server (<<http://dbs.schule.de>>) indexes and links school materials, a database of teaching and learning materials, websites of the major German textbook publishers, the directory of the German Society of Educational Researchers (Deutsche Gesellschaft für Erziehungswissenschaft DGE),¹¹ the German School Web (<<http://www.schule.de>>), and many other informational sources relevant to educationalists, teachers, school administrators and students. It also lists links to various educational libraries which offer their OPACs in the network and is planning to integrate further publications and course offerings with links between persons, institutions, publications, teaching materials, courses offered, etc.

Perhaps the greatest achievement thus far in this server is the database for teaching and learning materials ("Unterrichtsmaterialien und Projekte") which currently includes approximately 4200 entries for electronic documents, software, multimedia and interactive learning programs, cd-roms, books, etc. Using Dublin Core Metadata and several additional categories of metadata necessary for the German Educational Resources database,¹² these items can be searched using a simple and an expert mode, and the metadata entries can also be used as filtering mechanisms. The actual items are in distributed systems all over Germany and also outside of Germany. The metadata is entered using a template designed for this purpose and stored in a database to be searched using a dedicated Harvest search engine. The same template is now used at 10 of the State Educational Authorities Servers (see below), so there is complete standardization concerning the use of metadata and the retrieval mode. This database will possibly be connected with other databases for educational materials, especially curricula, course offerings, publications, and higher education institutions and researchers, so as to facilitate active links between authors, schools, university departments of educational and teacher training institutes, course offerings and curricula,

11 DgE-Online: *Adreßbuch Erziehungswissenschaft* <<http://dbs.schule.de/dgfe/handbuch.html>>

12 See Diann Rusch-Feja: Aufbau von internationalen Bildungsservern im Internet. Die Rolle von Metadaten für Lehr- und Lernmaterialiensammlungen. *GIB-News* 1'98 (1998), pp. 2-8 (<<http://www.educat.hu-berlin.de/gib/index2news.html>>); Peter Diepold and Christian Richter: "Meta-Tags": Hilfe zum Auffinden von Web-Seiten, 1997 (<<http://dbs.schule.de/bonsai/metatags.html>>); Diann Rusch-Feja and Christian Richter: Strukturierung von Informationquellen durch Metadaten am Beispiel des Deutschen Bildungsservers. In: *Schritte zur Qualitätsverbesserung von Bildungsinformationssystemen: Pragmatische Ansätze zu Akzeptanzsteigerung von Online- und Offline-Diensten. 5. GIB-Fachtagung, 1. und 2. Oktober 1997 in Halle*. Eds. A. Botte, D. Rusch-Feja, R. Theers. Berlin: Gesellschaft Information Bildung, 1998, pp. 87-121.

publications, and members of the university departments, professional societies, etc., In October 1998, continued funding for the DBS / GER was confirmed for three additional years. Due to changes in the institutional structure of the German Institute for International Educational Research and its greater concentration on services to the educational community, the DBS may in part (higher education, educational research, etc.) be maintained by DIPF after the additional funding is depleted. The part of DBS regarding school programs and school level materials will be maintained by the Institute for Film and Television in Teaching (FWU), located in Munich as of the year 2000.

At the same time as the German Educational Resources Server was being developed, several other school-oriented server architectures were evolving in Germany. Teachers took the initiative and started the Open School Network (ODS). A Federal Project for encouraging schools to be connected to the Internet and develop increased competencies in the use of networked information, "Schools on the Network" (SAN e.V.) was financed by the Federal Minister. Under this program, schools were provided with funding to obtain hardware and reduced networking costs. This was also supported by the WIN-SHUTTLE program of the German Research Network which supported a special connection for schools with a reduced connection rate. By the end of 1997 over 10,000 schools in Germany had Internet connections. Since the cultural ministry in each individual German state has jurisdiction over the educational system in that state, some states encourage the development of computer classes and networking courses in schools more than in others. Baden-Württemberg and Bavaria have developed individual information infrastructure programs which have included programs for computer classes in primary and secondary schools. Other states have various programs and in some cases, individual innovative teachers or schools are initiating course work in using computers and the Internet as an information source. In addition, a Federal project for providing schools with assistance in building websites and motivating connectivity is the "School-Web" project, has also been financed by the Federal Ministry of Education, Culture, Research, and Technology.

The State Educational Authorities' Servers ("Landesserver")

By February of 1996, before the German Educational Resources Server proposal was submitted, the representatives from 12 state educational authorities,¹³ as well

13 These state educational authorities ("Landesinstitute" or "Landesbildstellen") are responsible for providing continuing education for teachers, support for state curriculum development, and in general have a large repository of educational materials and media which can be provided to instructional staff or used by school administrators. The exact responsibilities and nature of the individual institutes vary according to the tasks prescribed by the individual state cultural ministries.

as representatives from the Open School Network, several university departments of education, and representatives of the Federal Ministry for Education, Research, Culture and Technology met in Bonn for an exchange of ideas concerning setting up an educational network of information resources, as well as integrating electronic resources into all levels of education. At the same time, talks were being held in other offices of the same Ministry with the German Telecom and a series of educational publishers. The issue of free access to information for educational purposes became a focal point. At this point, however, certain technological aspects played a key role, and the race for funding began. Fortunately, cooperation among the university education departments, the state educational authorities and even among teachers who had independently entered the Internet landscape on their own joined together to deliberate the needs of the community.

When the Deutscher Bildungs-Server received funding as the major non-commercial educational server, Prof. Diepold immediately sought not only contact, but also cooperation with the state educational authorities. Content discussions, quality aspects and organizational aspects were discussed and the state educational authorities agreed to cooperate with the DBS. Only a few state educational authorities had set up Websites at that time, others were in the planning, still others had no plans or had Web sites which were the sole initiative of one or two persons in the authorities on their own. Since 1996, representatives of the state educational servers have met twice a year at the invitation of Prof. Diepold.¹⁴ Cooperation agreements have led to the state educational servers having direct access to the DBS database of teaching and learning materials, in some cases under their own web name. Fourteen of the 16 state educational servers are continuing their data to the DBS (see map „Educational Information Servers in Germany“ in the appendix). Metadata for documents or objects held in distributed servers can be entered using the template for the DBS (<<http://dbs.schule.de/db/inconue.html>>) and will be sent to the central server metadata repository, while retaining the metadata information within the file itself or in the state educational server for additional search capacity. A dedicated search engine can be used to specify searching within the entire metadata server of the German Educational Resources Server or only in regional state educational servers. In this way and with the further integration of university educational departments, key special libraries for education, etc., an integrated, distributed information system for education is being achieved.

14 "Bonsai": Gemeinsame Tagungen der deutschen Bildungs-Server (<<http://dbs.schule.de/bonsai>>) gives the agenda and summaries of these meetings, as well as various other information on this cooperation.

All types of instructional materials can be entered and searched by means of a defined resource category, by the instructional level and/or by the subject of instruction. These options are available during the metadata entry through pull-down windows with reference tables. The entered metadata is used not only to obtain more precise searching capacities, but also provide filtering mechanisms during retrieval. For instance, if a teacher with limited band width has found a particularly interesting instructional unit, but sees from the metadata display that executing it requires a plug-in he does not have or that the file is in a format he cannot process, he will be able to avoid wasting the downloading time as well as other possible calamities. The expert search mode allows searching in any one or more servers, in the entire metadata server or in the servers registered in the German School Web. In addition, the user can specify the fields to be searched by incorporating stringsearch techniques. Instructions for searching for German words with umlauts are given. Boolean operators can be employed. In addition, the user has the choice in the expert search to be able to execute a case-sensitive search in the chosen text fields.

The German Educational Resources Server is not only restricted to indexing electronic resources in the Internet¹⁵. Physical objects, such as CD-ROMs with encyclopaedias or textbooks, lp's, sound cassettes, music CD's, texts, handouts, physical lecture notes, science models, physical games, and much more can be described using the same metadata categories, yet referring to a location outside of the Internet, yet most likely with an Internet-accessible contact address. During the last months of 1998, plans are being put into action for integrating curriculum offerings, linking names in the DGfE Directory with publications, linking electronic publications and courses, and much more.¹⁶ In addition, new cooperation agreements with school media publishers are in negotiation or have been signed. The funding of the German Educational Resources Server has been assured through 2002, and cooperation agreements with several educational research and development institutions within Germany will expand the scope and quality of the German Educational Resources Server. The DBS / GER is also actively participating in the development and expansion of the European School

15 Peter Diepold: Auf dem Weg zum Internet-gestützten, integrierten Informations- und Kommunikationssystem Bildung. In: *Schritte zur Qualitätsverbesserung von Bildungsinformationssystemen: Pragmatische Ansätze zur Akzeptanzsteigerung von Online- und Offlinediensten. 5. GIB-Fachtagung, 1.-2. Oktober 1997 in Halle*. Eds. A. Botte, D. Rusch-/Feja, R. Theers. Berlin: Gesellschaft Information Bildung, 1998, pp. 7-39; also in: *Erziehungswissenschaft* 8 (1997), 6, 24-52, <<http://educat.hu-berlin.de/dgfe/2000.html>>

16 Peter Diepold, Ordnung im Multimedia-Chaos: Bildungsserver und Meta-Daten. *Pädagogische Rundschau* 52 (1998) (im Druck)

Net (EUN) (<<http://www.eun.org>>) and internationally applicable metadata for education materials.

IV. Rounding out the Information Circle - Back to the Educational Libraries

Many of the most important educational libraries in Germany have their own websites and have been linked to through the German Educational Resources Server. Several have built up their own additional collections of annotated Websites to supplement their collection specialism. The Max Planck Institute for Human Development (MPIB)¹⁷ has its specialized OPAC with extensive indexing and additional listings of electronic resources in the Internet, as well as its "Clearinghouse for Project-Oriented Internet Information Resources", an annotated database of Internet resources structured into resource pages according to the needs of the research projects in the Institute (<<http://www.mpi-berlin.mpg.de/dok/ech.htm>>). The Library for Historical Educational Research (BBF) offers its library OPAC in the net, as do the Federal Institutes for vocational and adult education, State institutes for teachers' training materials, special education, etc. All these institutions are linked through their own sites, as well as to and from the German Educational Resources Server. In addition, the Resources and Information Service of the Educational Faculty of the Free University of Berlin (SE EWIFIS) offers a broad listing of materials including annotated sites for educational instructors and researchers.¹⁸ The loose "connection" between these varied, yet educationally relevant sites covering all aspects of education functions as a network literally creating a virtual German national library of education. Especially in a country where political systems repeatedly purged schools and libraries of various educationally relevant book collections, where bombings destroyed a considerable number of library collections, where educational reform after the second World War, "denazification", and most recently, "de-Socialization" of education in the new German states have presented new problems for archiving, collecting, indexing, and finding the broad spectrum of diverse educational philosophies, instructional materials, educational research results and methodologies, decrees, etc., the connection and "bringing together" of dispersed educational resources at the metadata level can be achieved. Thus the missing German national library of education is a virtual one, but certainly not any less comprehensive and diverse in its collections! And in this way, educational libraries are not only cooperating to support educational institutions, the

17 The English translation of this institutional name was formerly "Max Planck Institute for Human Development and Education".

18 Service-Einrichtung Erziehungswissenschaftlicher Fachinformationsservice (SE EWIFIS): Informationsmittel und (Internet-)Adressen zur Pädagogik/Erziehungswissenschaft <<http://www.fu-berlin.de/ewifis/informationsmittel.htm>>

educators and those being educated. They are expanding their collections and their plethora of information resources far beyond the library walls, attesting to the image of the learning institution, expanding with new focus, new methods, and new organizational structures.

As a central coordinating unit, FIS-Bildung has more or less taken over responsibility for national bibliographic services in the field of education. Document delivery has been achieved in part through the holdings records in the CD-Bildung (and will be expanded in the future to include true document delivery services), but also through the Special Subject Collection for Education in the University Library at Erlangen, as well as others. But FIS-Bildung cannot fulfill its national (supraregional) bibliographic functions without submission of title entry material, indexing and abstract from the individual libraries and documentation units with important educational collections, and it can only serve as an instrument for locating these materials as it only has direct access to certain materials within the DIPF service units. The individual libraries and information centers offer various reference and information services, the state educational authorities offer additional materials specifically for teachers and administrators. The DBS provides information on those materials not ordinarily found in German educational libraries as it falls beyond the scope of the traditional libraries, and at the metadata level brings together all types of resources not previously collected at any one site. Thus, these institutions, the "addition of their parts", their coordination, and a central metainformation server integrating and structuring their offerings for the users cooperate to form a "virtual national library of education" in the broadest sense. Additional collaboration and cooperation possibilities with other national educational servers such as the ERIC Gateway for Educational Materials (GEM), or Educom's Instructional Materials System (IMS), EdNA in Australia and the European SchoolNet are seen as the means of harmonizing metadata within the educational information field. In addition, more contact between the educational servers of the world with comfortable access and similar structures will enhance users' opportunities for finding precise and relevant information for teaching, curriculum development, educational and school re-search, literature, comparative study of educational systems, etc. Even in this field of education, rooted deeply in the particular social, legal and administrative structures of an individual country and often also in the linguistic parameters of the national language, the effects of the Internet and globalization are evident. The benefits of these developments are obvious, the tasks to further cooperation and development, however, are great, but not insurmountable. The audience interest in the IFLA session in which this paper was presented with three others depicting the national libraries of education or similar structures in the US,

Denmark, and the Baltic countries is a significant indication of the relevance of this task.

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