

ELECTRONIC LEARNING AND TEACHING COMMERCE VIA EDUCATION SERVERS IN GERMANY

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THE ACTUAL TREND OF VIRTUAL LEARNING AND TEACHING

With the increasing spreading of new media and communication technologies such as Internet/WorldWideWeb (the 'Web') also the electronic market for 'virtual learning and teaching' becomes a vital part of the commercial side of the Web. The reason therefore is that learning and teaching, and with it related administration and care processes can be supported by using the Web in so far as they become independent of time and place, i.e. they become virtual. In addition to that, the animation potentials of new media technologies can be used to enrich, stimulate, and reshape learning and teaching (following Winand 1997). Furthermore allows the active use of Web-based learning and teaching technologies to enhance the so-called 'media competencies' which become increasingly important for employees, and society as a whole. That is, new capabilities are needed in order to deal with, e.g. video conferences, interactive business television, chatting, distributed document processing, teleprocessing with banks or travel agencies, and navigating in virtual worlds on the Web and increasingly also on Intranets. Competencies to develop these new media technologies and applications, and especially competencies to use them are heavily requested which can only be acquired satisfactory by actively dealing with these new technologies, in the end (see Heller, von Kortzfleisch and Winand 1998).

PROBLEMS OF ELECTRONIC LEARNING AND TEACHING COMMERCE

One of the most important problems of electronic learning and teaching commerce (see also Landesinstitut für Schule und Weiterbildung 1996a) is that the transparency of Web-based learning and teaching technologies is deficient. The spectrum of these technologies comprises many and quite heterogeneous categories like (see

also Congress of The United States – Office of Technology Assessment 1988):

- ◆ software for the development of e.g. teaching materials, timetables, and certificates;
- ◆ reference books or encyclopedia on the Web;
- ◆ traditional educational technologies on the Web, such as books, videos, transparencies, collections of examination papers;

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- ◆ learning and teaching applications on the Web using new hyper- and multimedia technologies in order to create so-called "virtual learningworlds".

Another problem of electronic learning and teaching commerce is that the development costs for especially virtual learningworlds are estimated to be more than 10 times higher than for traditional learning technologies. Furthermore, due to the deficient transparency communication between different research and development projects is missing, i.e. from an economic perspective resources are misdistributed which implies also negative employment effects. The misdistribution of resources is reflected even more in the maintenance costs. Finally, it is difficult to judge the quality of virtual learningworlds from the view of pedagogics and didactics, also as a result of the insufficient transparency. Regarding these problems education servers aim at to overcome them.

EDUCATION SERVERS AND THE 'FORUM VIRTUAL LEARNINGWORLDS'
Education servers can be described as virtual institutions on the Internet or Intranets which have to be placed in the area of electronic learning and teaching commerce, i.e. in the area of trading with Web-based learning and teaching technologies. Primarily they try to collect information on learning and teaching on the Web in order to provide a higher degree of transparency. The following examples of education servers in Germany (see figure 1) were selected corresponding to the criteria of representativity, originality, and name recognition. It is discernible that education servers are run by both, non-profit and for-profit organizations and that the focal point lies in the area of schools.

In comparison with the education servers described in figure 1 the 'Forum Virtual Learningworlds' ('Forum Virtuelle Lernwelten'; see the prototype under <http://lernwelt-forum.wirtschaft.uni-kassel.de>, and in the near future the professional

FOCUS THEME

Name	URL	Organization	Comments
Bildung Online	www.b-o.de	Educational Publishers 'Cornelsen', 'Ernst Klett', 'Schroedel' and 'Westermann'	Commercial server which concentrates on schools in a wider sense (teachers, pupils, parents, school institutions).
Deutscher Bildungsserver (DBS)	www.dbs.schule.de	Association German Research Net ('Verein Deutsches Forschungsnetz; DFN-Verein) in co-operation with the Humboldt-University Berlin	Non-commercial server with all kinds of information concerning learning and teaching. The server also centers all the activities of the Lands ('Bundesländer') concerning education servers concentrating on schools.
Forum Berufsbildung	www.berufsbildung.de	Publisher 'W. Bertelsmann Verlag' (WBV)	Free service focusing the professional education.
Forum Bildung und Lernen	www.bildung-lernen.de	Hagemann-Online, which belongs to the publisher 'Hagemann & Partner Bildungsmedien Verlags GmbH'	Commercial server concentrating on schools.
Forum Virtual Learningworlds	www.lernforum.de	University of Kassel; 'GMD'; 'MIT-Beratung'	Research project trying to implement a sophisticated, all-embracing platform for electronic learning and teaching commerce.
Global Learning	www.global-learning.de	German Telecom ('Deutsche Telekom AG')	Commercial server aiming at to provide a uniform and modular platform for sellers of learning and teaching technologies.
Kurs Direkt	www.kursdirekt.de	Federal Institution for Labor ('Bundesanstalt für Arbeit') together with the 'Institut der Deutschen Wirtschaft, Köln'	Online database with information of ca. 300.000 traditional; i.e. non-online offers of professional education and training sellers.
Learn:line NRW	www.learn-line.nrw.de	Federal Institute for School and Education ('Landesinstitut für Schule und Weiterbildung, Soest')	Education server of the Land North Rhine-Westphalia with the possibility for the users to actively design individual 'learning topics'.
NiBiS – Niedersächsischer Bildungsserver	nibis.ni.schule.de	Federal Institute for Further Education and Training in School Systems and for Media Pedagogic of the Land Lower Saxony ('Niedersächsisches Landesinstitut für Fortbildung und Weiterbildung im Schulwesen und Medienpädagogik')	Education server of the Land Lower Saxony which concentrates on the further education of teachers.
ZUM Zentrale für Unterrichtsmedien	www.zum.de	Association 'Zentrale für Unterrichtsmedien im Internet e. V.'	Non-commercial initiative of teachers which clearly concentrates on schools

Figure 1

Selected Education Servers in Germany and the 'Forum Virtual Learningworlds'

version under <http://www.lernforum.de>) strictly addresses the problems of electronic learning and teaching commerce with an all-embracing concept. The basis for this concept is:

- ◆ a broad survey of existing virtual learningworlds, the classification of these worlds according to a description language developed by the authors (see von Kortzfleisch, Heller and Winand 1997) including criterions from pedagogics, business administration and informatics, and the changeover into a database;
- ◆ the offer of comfortable search possibilities for the database;
- ◆ the provision of hyperlinks in order to directly access the classified learning-worlds, its developers or persons in charge, respectively and experienced users;

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Congress of The United States – Office of Technology Assessment (Ed.) "Power On! New Tools for Teaching and Learning", Washington/DC 1988.

Griese, J. "Unternehmerische Konzepte zur Nutzung des Internet", in: *Internet: Nutzung für Unternehmungen*, ed. by Griese, J. and Siebert, P., Bern et al. 1996, pp. 9-24.

Heller, U., von Kortzfleisch, H.F.O. and Winand, U. "Medienkompetenz: eine erste Annäherung", Workingpaper No. 19. of the Chair for Business Informatics of the University of Kassel, Kassel 1998.

- ◆ the implementation of communication and cooperation functionalities in order to exchange experiences, offer support, and evaluate feedback, for example;
- ◆ the implementation of secure electronic commerce and barter functionalities.

Altogether, the 'Forum Virtual Learningworlds' addresses to people – with a focal point also on small and medium-sized companies – who are interested in the potential use of Web-based teaching and learning technologies. The forum aims to provide a sophisticated platform for electronic learning and teaching commerce, thereby concentrating on virtual learning-worlds.

**TYPOLGY OF EDUCATION SERVERS
FROM AN ELECTRONIC MARKET
PERSPECTIVE**

Beside many other possible typologies (see Griese 1996; Kurbel 1997; Picot, Reichwald and Wigand 1996) one way of classifying education servers is to ask for the organizational role in the electronic market. Corresponding to this criterion education servers can be distinguished whether they are:

- ◆ 'Access Servers': They provide a systematic access to Web-based learning and teaching technologies, i.e. the server mediates between a potential demand and the existing offer ('information turntable');
- ◆ 'Brokers': They bring together the (best) offer according to the demand expressed ('offer production');
- ◆ 'Consultants': They find out the precise needs of the demand and compose related offers, individually ('demand determination');
- ◆ 'Content Providers': They offer their own Web-based teaching and learning technologies ('offer development').

Another relevant criterion against the background of electronic commerce in order to classify education servers is to

Kurbel, K. "Internet-Nutzung im Business-to-Business-Bereich: Stand der Entwicklung, Typologie und Anwendungsbeispiele", in: *Wirtschaftsinformatik '97: Internationale Geschäftstätigkeit auf der Basis flexibler Organisationsstrukturen und leistungsfähiger Informationssysteme*, Heidelberg 1997, pp. 23-34.

Landesinstitut für Schule und Weiterbildung (Ed.) "Prüfung Neuer Medien für den Unterricht", processed by W. Weber, 2. Ed., Soest 1996a.

Landesinstitut für Schule und Weiterbildung "Vorschlag für die pädagogische Konzeption des NRW-Bildungsservers", Workinggroup 'NRW-Bildungsserver', submitted on June 10, 1996, Soest 1996b.

Picot, A., Reichwald, R. and Wigand, R.T. "Die grenzenlose Unternehmung: Information, Organisation und Management", Wiesbaden 1996.

look at the spectrum of necessary functionalities the servers offer (see also Landesinstitut für Schule und Weiterbildung 1996b). From a potential customer's perspective the following functionalities can be distinguished:

- ◆ 'Search': The search for Web-based learning and teaching technologies and for additional information like reports of experience, for example should be supported;
- ◆ 'Communication and Cooperation': Communication and cooperation should be possible between different people such as teachers, other students, tutors, developers, producers, or other experts.
- ◆ 'Support': Support in the form of help texts, reference users, frequently asked question-lists, for example should be provided concerning both, the education server itself and the learning and teaching technologies made accessible by the server;
- ◆ 'Administration': Administration processes should be supported such as orders, bookings of courses, examination enrollments, calendar management, sending of certificates, or settlements.
- ◆ 'Consulting': The possibility should be supported to find out the precise needs of the potential users and to compose related offers, individually on the basis of previously evaluated Web-based learning and teaching technologies ("best practices") or modules of these technologies.
- ◆ 'Learning': The education server should offer its own learning and teaching technologies.

Figure 2 classifies the different German education servers according to their role in the market.

In relation to the functionalities they provide the German education servers can be differentiated as shown in figure 3:

	Access Server	Broker	Consultant	Content Provider
Bildung Online	◆			◆
DBS	◆		◇	
Forum Berufsbildung	◆			
Forum Bildung & Lernen	◆	◇		
Forum Virtual Learningworlds	◆	◆	◆	◆
Global Learning	◆	◆	◆ (intended)	◆ (intended)
KursDirekt	◆			
Learn:line NRW	◆		◆	◆
NiBiS	◆			
ZUM	◆			

Figure 2
Market Role of Education Servers; authors' evaluation

Legend
◆ = available; ◆ = partly available; ◇ = basically available

FOCUS THEME

	Search	Communication and Cooperation	Support	Administration	Consulting	Learning
Bildung Online (intended for parents)	♦	♦				♦
DBS	♦	♦			◇	
Forum Berufsbildung	♦					
Forum Bildung & Lernen	♦			◇		
Forum Virtual Learningworlds	♦	♦	♦	♦	♦	♦
Global Learning	♦	♦	◇	♦	◇	♦
KursDirekt	♦					
Learn:line NRW	♦	♦			♦	♦
NI BIS	♦					
ZUM	♦	♦				

Figure 3
Functionalities of German Education Servers; authors' evaluation

Legend

♦ = available; ♦ = partly available; ◇ = basically available

To sum it up it can be said that the 'Forum Virtual Learningworlds' is the one German education server which fulfils all possible roles of education servers in electronic markets and also offers all possible functionalities needed for electronic learning and teaching commerce.

Finally it has to be mentioned that the online learning and teaching possibility which shall be brought into action by means of the 'Forum Virtual Learningworlds' is developed following the paradigm of constructionist learning (see von Glaserfeld 1995). The first learning application of this technology is in the field of business informatics. Correspondingly the projects' name is 'WirtschaftsINFORMATIK (Business Informatics) On-Line; WINFO-Line' (see <http://www.winfoline.de>). Features of WINFO-Line are target group specific configuration of learning modules, uniform structure of learning applications, flexible use of multimedia, additional online learning materials, online student advisory service, and online examinations for example.

Von Glaserfeld, E.

"Radical Constructivism: A Way of Knowing and Learning", London 1995.

Von Kortzfleisch, H., Heller, U. and Winand, U. *"Entwicklung einer Beschreibungssprache für 'virtuelle Lernwelten'", Workingpaper No. 18 of the Chair for Business Informatics of the University of Kassel, Kassel 1997.*

Winand, U. *"Virtuality - Focus: Media and Communication Technologies", in: VoNet Newsletter, Vol. 2, No. 3, 1997, URL = http://www.virtual-organization.net/news/nl_1.3/winand.html.*

FURTHER REMARKS

The 'Forum Virtual Learningworlds' ('Forum Virtuelle Lernwelten') is developed by the Chair for Business Informatics at the University of Kassel (project management), the 'GMD - Forschungszentrum Informationstechnik GmbH' with the institutes for 'TeleKooperationsTechnik' (TKT) and 'Integrierte Publikations- und Informationssysteme' (IPSI), Darmstadt and the 'MIT-Beratung, Gesellschaft für Management-Beratung, Informationssysteme und Technologie mbH', Essen, a 100% subsidiary of 'RWE Aktiengesellschaft'. The Forum is part of the integrated research project DeMeS ('Development of Media Services'; <http://demes.darmstadt.gmd.de>) within the scope of the initiative "Services for the 21st Century" ('Dienstleistungen im 21. Jahrhundert') sponsored by the German Ministry for Education, Science, Research and Technology ('Bundesministerium für Bildung, Wissenschaft, Forschung und Technologie; BMBF').