

How to Teach Teachers to Teach with New Media: Initial and Further Teacher Education in a web-based Collaborative Distant Learning Environment

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Abstract

The project eL3 – eLearning and eTeaching in initial and further teacher education – is presented, the concept for 16 courses for the integration of information technology into a large number of school subjects and school types is described and the results from the first pilot courses are reported.

The concept aims at establishing a distance education course system, that also includes some „real“ meetings of the participants and relies heavily on web-based communication and collaboration of the participants in order to support active, self-organised learning.

Zusammenfassung

Es wird das Projekt eL3 – eLernen und eLehren in der Lehrer-Aus- und Weiterbildung – vorgestellt, das Konzept für 16 Kurse zur Integration Neuer Medien in den Unterricht verschiedener Schulfächer und aller Schularten und Schulstufen beschrieben und über die ersten Ergebnisse der Probeläufe einiger Kurse berichtet.

Das Konzept baut auf einem web-basierten Fernstudienangebot auf, das durch einige Präsenzphasen und durch webgestützte Kommunikation und Kooperation der Kursteilnehmer geprägt ist und das aktive selbstorganisierte Lernen unterstützen soll.

1 OBJECTIVES

Investigations of the present situation in German schools show that only a minority of teachers actively uses Information and Communication Technology (ITC) for teaching or for the preparation of teaching material: roughly estimated approximately 5 % of the teachers use computers in the classroom, 2 % use the internet (Drabe, 2001).

Several European and German initiatives are under way in order to improve teaching and learning in schools. In Germany the most powerful programme in this context is the Programme New Media in Education (BMBF, 2000). Within this context the Universities of Erlangen-Nuernberg and Oldenburg have started a project which aims at developing a system of web-based distance education courses with three goals:

- enhancement of the individual teacher's „media competence“ and improvement of his/her ICT skills;
- solid knowledge of the methodological implications of ICT applications in the classroom („ICT didactics“);

- solid knowledge of the methodology for creating media competence („media pedagogics“);
- distribution of the courses to other institutions of higher education.

Since the two project partners pursue slightly varying concepts and use different organisation forms (due to regional influences and restrictions), we will in this paper refer to the concepts of Erlangen as „eL3-South“ and of Oldenburg as „eL3-North“.

Target group:

1. Teachers in service (general and vocational schools),
2. Teacher students in their 3rd or 4th year.

At both universities the delivery of the courses is embedded in other related activities:

eL3-North: The courses are part of the study stream „Neue Medien in der Wissensgesellschaft“ (MeDiAs, 2001) leading to an additional certificate to the degree in teacher education („Staatsexamen“). Supplementarily they are part of the course system offered by the „Oldenburger Fortbildungszentrum“, an institution for the delivery of in-service courses for teachers.

eL3-south: The courses are part of the Bavarian online learning system „Virtuelle Hochschule Bayern“ (Virtuelle Hochschule Bayern, 2002).

2 COURSE CONCEPT

Preceding to the design of our course system we investigated related concepts in other European countries. The context and the content of the Danish educational programme „Skole-IT“ (Uni-C, 2001) proved to be very close to our needs. This system developed by UNI-C has been implemented since 1999; in February 2002 approximately 26 000 teachers were participating or had successfully participated in their courses in order to acquire a „Pedagogical IT Drivers License“ (UNI-C, 2000).

Much to our regret the organisational structure of the course delivery in Denmark is to such an extent incompatible to the German educational system, that it was not feasible to adapt the Uni-C learning platform.

One leading principle for the courses is the subject orientation, to enable teachers to work jointly on ICT (of all school types) applications for their specific school subject. Therefore we are developing separate courses for teachers of English, French, Religion/Ethics and Geography in *eL3-south* and German, History, Mathematics, Biology, Chemistry, Physics, Music and Fine Arts in *eL3-north*. Other school subjects will follow.

The didactical concept aims at supporting active, self-organised learning of the participants with several real face-to-face meetings during each course and with collaborative task solving in small groups.

3 COURSE TYPES

There are three course types:

1. „Basics of ITC applications in subject X“, mostly stressing the teacher's use of ITC „media competence“;

2. „New Media in subject X“, aiming at developing the teachers' competence in ICT didactics and media pedagogics;
3. Special courses for areas with higher technological complexity, such as the design and development of new interactive teaching and learning material: database applications, simulations, animations and video films.

The course material is structured in modules, which allow individual sequencing. The modules are designed to support open, self-organised, exploratory learning, especially also in cooperative situations. For each school subject we have developed specialised modules for these topics:

- Teaching and learning with the computer
- Computer-mediated communication and collaboration
- Information retrieval
- CBT programs (esp. their evaluation)
- Design of student work sheets

To give an impression of the material we present a screenshot (Fig. 1) from the module Information Retrieval for history teachers. It shows a text sample from a pilot course of the summer term 2002, which stresses the advantages of new media in history teaching. (It also shows the provisional layout of our learning platform Hyperwave eLearning Suite and for our contents. The course material to be presented in the winter term 2002/2003 will have a layout for the eLearning Suite specifically customised for eL3.)

HYPERWAVE eLearning Suite

Kursraum
Modul Geschichte - Recherche

Suche
Notiz
Forum
Infoboard
Nachrichten
Chats
Bibliothek
Glossar
Tests
Studierzimmer

Internationalisierung Die Praxis des Geschichtsunterrichts wird traditionell stark durch nationale Traditionen geprägt. Diese nationale Zentrierung wird durch das WWW aufgebrochen:

Schülerinnen und Schüler können sich unabhängig vom jeweiligen Lehrplan über die Geschichte und Kultur anderer Länder informieren. Lehrende können sich über die Grenzen hinweg über den Geschichtsunterricht in anderen Ländern informieren, z. B. englischsprachige Unterrichtsmaterialien herunterladen oder mit Kolleginnen und Kollegen in Genf oder Liverpool Kontakt aufnehmen.

Rufen Sie den englischen Server SchoolHistory (<http://www.schoolhistory.co.uk/>) ([Web](#)) erkunden Sie dessen Struktur und einige Sie interessierende Angebote.

SchoolHistory.co.uk
SchoolHistory.co.uk

Gehen Sie in gleicher Weise für HISTOMAT (<http://www.histomat.ch/>) ([Web](#)) vor, den "Automaten" des Vereins Schweizerischer Geschichtslehrerinnen und -lehrer. Charakterisieren Sie die beiden Angebote und veröffentlichen Sie Ihr Ergebnis im Forum.

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Fig. 1: Information Retrieval for History teachers

The courses of type 2 normally have six modules:

- Image and video manipulation
- Presentations
- Animations and simulations
- Interactive student work sheets
- Data collection and
- The use of database systems

As an example for this 2nd type of course an application of databases in geometry is shown in Fig. 2.

Eine **Datenbank** (engl. database) ist eine integrierte Zusammenfassung von **Daten**, die Objekte (**GL**) mit bestimmten Eigenschaften (Attributen (**GL**)) aus der Realität repräsentiert. Die nach den natürlichen Zusammenhängen strukturierten Daten sind in der Datenbank beschrieben, gespeichert und abrufbar.

Objekte mit gleichen Attributen lassen sich kontextabhängig als zusammengehörige Menge aus Daten auffassen, die in der Datenbank als Gesamtbestand verwaltet wird.

Die mit Hilfe eines Computers darstellbaren Attributwerte von Objekten, die Daten, können von unterschiedlicher Art sein: Texte, Zahlen, Bilder, Animationen (**GL**), Videos, Applets (**GL**) Hyperlinks, Wahrheitswerte (**GL**).

Datenbanken sind in Situationen einsetzbar, in denen reale Objekte mit gleichen Attributen in sehr großer Zahl zu verwalten sind und von mehreren Anwendungsprogrammen oder Anwendern gemeinsam benutzt werden.

bsp

Betrachten Sie die geometrischen Figuren Dreieck und Viereck. Diese lassen sich zum Beispiel als Objekte der Klasse "geometrische Figuren" auffassen. Beide Objekte können durch verschiedene Attribute wie "Achsensymmetrie", "Punktsymmetrie", "Flächeninhalt", "Umfang" usw. beschrieben werden.

Das Attribut "Achsensymmetrie" des Objektes Viereck kann zum Beispiel den Wert "keine Symmetrie" annehmen.

[Hier](#) sehen Sie, wie sich das Bild in mehreren Schritten aufbaut.

Fig. 2: The use of databases in Mathematics teaching

The courses of the 3rd type have not yet been designed. They will be delivered in summer 2003.

4 COURSE FORMAT

For one distance education course a learner will have to work between 50 and 70 hours (approx. equivalent to a one-semester university seminar with 2 hrs/week through 15 weeks). The course will start with a „real“ meeting of all participants from one region with their lecturer and the tutors. Two other „real“ meetings will follow. Between these meetings the group communication and the contact with the tutor is virtual.

5 COLLABORATIVE LEARNING

The learning platforms for the courses (*eL3-South*: ILIAS, *eL3-North*: Hyperwave eLearning Suite) provide group-oriented email, bulletin board messaging (including attachments) and chats. It is very easy for the participants to form new groups for special purposes and use the communication tools of the platforms.

The course material is designed especially with the focus on collaborative learning situations, e.g., solving tasks in small groups of approx. 5 participants, because this format easily kindles discussions. At a later stage we plan to implement online video conferencing also for these groups in order to improve the collaborative task solving process.

In practice each course starts with a „real“ joint meeting of the participants, the course leader and the tutors. At least one other meeting will follow during the term. All other communication is based on the tools, which the World Wide Web is offering.

6 ORGANISATIONAL ISSUES

6.1 FIRST RESULTS

The first results from the test phase will be presented during the conference due to the early editorial deadline for the proceedings.

6.2 EVALUATION

The evaluation team will investigate acquired knowledge and satisfaction of our participants, the comparison of distance education courses with regular university courses for teacher students, and the comparison of the two learning platforms.

6.3 PROJECT ORGANISATION

Dr. Walter Kugemann at FIM-Psychologie, Universität Erlangen, heads the project consortium of eL3. He is also project leader for the Erlangen group (*eL3-south*). At the University of Oldenburg the group *eL3-north* is headed by Prof. Dr. Peter Gorny, Faculty of Informatics, who is also in charge of the IT-team, while the content providing and the course delivery is organised by Prof. Dr. Hilke Günther-Arndt, Historical Seminar, with the support of Dr. Ulrike Daldrup, Learning Lab for Multimedia Teaching.

The project staff consists of 11 full time members – 3 Computer Science specialists and 8 specialists for the educational content and the course organisation. In addition we rely heavily on a varying number of part time co-workers, mostly teachers who are on part time leave from their schools and who write special parts of the course material.

The development time is 2.5 years in the years 2001–2003.

The test phase for our course concept was in summer 2002 with only 15 to 20 participants in each of the few courses; the first full run is during the winter term 2002/2003. The course system will be completed in spring 2003, so that the summer term will give us the possibility to present the complete set of courses to a broad audience in summer 2003.

6.4 ACKNOWLEDGMENT

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6.5 CONTACT

The project website: <http://www.eL3.de>

The project eMail address: info@eL3.de

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