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The Use of New Media in Education

Opportunities and Challenges of Cooperative Teaching and Learning in Art History

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SUMMARY . ABSTRACT

Universities of the future will continue in Wilhelm von Humboldt's tradition of scholarship as the unity of research, instruction and education, but they will also have to face the challenges which accompany the digitalization of the world in the 21st century. A notion of network-based 'distance learning' will be developed through the new organization of information provided by the Art History Seminar in the WWW. The goal of this project is to provide productive support for actual classroom learning through 'pools of knowledge,' which will cooperatively managed and which can be tailored to the personal needs and interests of the course participants. The best way to develop and implement these structures is through a three-staged progressive workflow model, in which each of the respective stages functions as the presupposition for the subsequent stage.

From slide projection to »Distant Learning«

The significance of knowledge in our society has not only increased; its profile has also changed through the process of technologization, in particular through the transformation of the computer from a tool or implement to a medium of knowledge-transfer. Dealing with new media and information technologies has become one of the key areas of competency in modern societies caught in the upheaval from an industrial society to a communication and knowledge society, in which forms of intellectual labor will dominate in the future. Colleges and universities are simultaneously affected and challenged by this transformation.

Universities of the future will continue in Wilhelm von Humboldt's tradition of scholarship as the unity of research, instruction and education, but they will also have to face the challenges which accompany the digitalization of the world in the 21st century. The use of new media in learning and education not only alters the substantive and structural demands made upon educational institutions. Such media also offer new possibilities for the processing of knowledge, for its presentation as well as for its pedagogical mediation in the lecture hall or seminar room.

Interactive homepage The project *interaktive [interactive] Homepage* of the Humboldt University's Art History Seminar will promote and implement a broad, long-term integration of the new media both as a means of teaching, learning and communication, and as one for qualitatively improving course offerings through media support.

A notion of network-based 'distance learning' will be developed through the new organization of information provided by the Art History Seminar in the WWW. The goal here is to provide productive support for actual classroom learning through 'pools of knowledge,' which will cooperatively managed and which can be tailored to the personal needs and interests of the

course participants. Two elements are of central importance here, both of which are equally concerned with teaching and research (fig. 1):

fig. 1
The entrance web page of the department of art history at Humboldt University Berlin. These representative pages are based on standard HTML. The project *Interactive Homepage* enriches the Website by adding dynamic content step-by-step.

Interactive homepage = system_kgs
Today the project's name has changed to *systems_kgs* - a framework for web-based publishing in art history.

(1) The development of databank-supported client-server systems, which support the processing and networking of digital information, makes possible the distribution of knowledge at a reasonable price and with the efficient use of an institute's personnel. These systems, which are accessible via the Internet at great distances and independent of space and time, provide the optimal presuppositions for multimedia self-directed study. In the face of educational-political prognoses and calls for "increased efficiency in instruction," these forms provide the technological and cost-effective 'solution'.

(2) Bringing together isolated sources of knowledge and organizing them properly according to unified standards and interfaces based on internet technologies provides the discipline of art history with unique and as yet unrealized opportunities. These include the generation of new cognitive connections as well practical possibilities for professional use on the basis of a "best practice strategy". Such "knowledge management" conceptions require, on the one hand, a centrally directed general authority which can regulate, on the technological-administrative level, the overall organization of information in the emerging pool of knowledge – in other words, an art-history service provider.

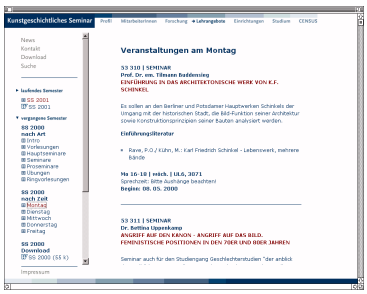
On the other hand, this means that students and instructors now have both the opportunity to use this *personalized and newly contextualized knowledge* and the obligation to update it (key words: central administration – decentralized input made according to a pre-determined set of rules).

The best way to develop and implement these structures is through a three-staged progressive workflow model, in which each of the respective stages functions as the presupposition for the subsequent stage.

The construction of a databank-supported Web site

Based upon the actual structure of the institute's 'homepage', a*content-management solution* as Backend Service provides all members of the institute with different possibilities for updating the institute's own information in a simple and decentralized manner. The system provides authorized members access independent of time and space to pre-structured data relating to the institute's information services.

The fundamental elements here include schedule changes, lists of events, current announcements of the institute and [other] categories of information, all of which can be updated easily and quickly at short notice. The entire contents are generated from an SQL-database server. They can thus be searched and indexed, and be designated as 'interactive', if we understand



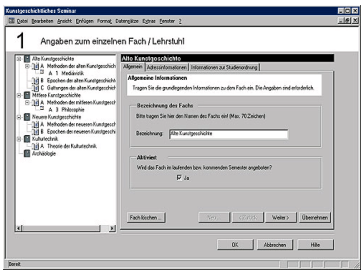


fig. 2 and 3. **Input of highly-structured data, as - for example - the commented lectures directory. The HTML page shown above represents one of a multitude of output options.**

interactivity here as the one-sided capacity to alter data sets over the Internet. Individual projects within the institute which are based upon similar concepts can also be integrated through this technology – for example, the structured archives of historical images, texts or videos, as well as work collections or literature databanks (fig. 2 and 3).

Open standards Already in this phase, it is of decisive importance for the implementation of a knowledge-system extending beyond individual institutions that uniform indexing standards be developed according to international, national and individual criteria, which can then applied consistently to objects or records. The open meta-data standards, which have been advocated as a result of the W3-consortium's pioneer work and which guarantee the greatest possible openness and flexibility in individual adaptation on the basis of *SGML/XML*, have priority here. Concerning national art-historical iconographic set of rules, the *MIDAS* categorization schema *(Marburg Index)* is both desirable or conceivable, while concepts specific to institutions or collections – for example, those categories underlying the collections at the Humboldt University – could be included in such a system as an historical dimension.

In combination with existing subscription services frequently used on the Internet, information updates could be sent immediately via email "on the fly" to subscribers who have been registered in advance on the website.

Such a database-supported distribution of information does not, in itself, represent a comprehensive KM-solution based upon best practice strategies. However, even at this stage it does solve at least two fundamental problems of information management internal to the institute:

- Since a decentralized alteration of data sets published on the Internet is, in principle, possible for all authorized persons at any time or place, the classic 'contact people for the institute's homepage' are relieved of much of the technical work and thus are able to concentrate on more 'meaningful' scholarly tasks.

- Through such subscription features, the classic 'blackboard' diminishes in significance. Part of the work traditionally performed by secretaries can now be much more efficiently organized. The addressees for institute news (room changes, postponements or cancellations of events) are now informed through email subscription, and thus no longer appear as *potential*, incalculable recipients groups. Rather, subscribers can be addressed immediately and *actually* on a one-to-one basis.

- Finally, the fact that key information no longer exists as static HTML documents, but rather is stored on databanks makes possible additional evaluative criteria. For example, answers to questions can be generated automatically according to the frequency of particular subjects, publications, etc., and no longer have to be put together manually with great effort.

Online Seminars and Distance Learning

In the second stage, the existing content-management system will be expanded to include distance-learning functions. It now becomes possible for students to organize a personalized study plan automatically adjusted to university course requirements. The concrete organization and practical realization of courses via computer also becomes possible – either exclusively through the new media or as a supplement to 'traditional' course offerings. Instruction and learning materials which have traditionally been presented in person or on paper (e.g. thesis papers, seminar contributions, presentations and papers, session protocols) can be now be distributed in electronic form to registered seminar participants as 'downloads' or in an online version. The participants receiving such materials can respond by making their own work ma-

terials or research contributions available as 'uploads' to the seminar's temporary online-community. In this way, a self-organized distance learning with an increasing pool of knowledge arises which is independent of time and space and which requires no additional expenditure of finances or staff. At the end of the seminar, the accumulated knowledge can, if desired, be made accessible to the art-history public; in any event, it can be stored permanently in an electronic archive. Additional interactive services such as online discussion forums accompany the course, as do personalized newsletters and mailing lists. The need for visual representation of this course conception as well as the option of multimedia use will be provided through the integration of speaking user-interface metaphors, images, sound and (streaming) videos. The user/ seminar participant will be offered intuitive access to the various materials through a virtual 'desktop', a 'personal workspace' in the web browser, a virtual 'slide projector', and library 'reference works' online.

Distance-learning environment This distance-learning environment thus allows the actual courses offered in the seminar rooms of the Humboldt University to appear in a new light. While the processing of learning materials as well as the formal preparation by seminar participants can occur as distance learning, seminars themselves become forums in which participants, who have been optimally prepared, engage in grounded discussions based upon knowledge and information which has been collectively attained and archived. Those phases of knowledge transmission which are both time and resource intensive such as presentations and lectures – i.e., forms of mediation which are oriented one-dimensionally – will be optimized to the individual needs of the participants (learning rhythms, repeating phases). At the same time, the communicative quality of seminar discussions will increase.

The development of a platform of knowledge for art history

Within the framework of disseminating and networking the emerging pool of knowledge beyond the institute's boundaries, a real 'knowledge management system for art history' can be constructed through coordinated inter-institutional organization. In addition to the classic databanks for images, literature and iconography, such a knowledge portal represents a new way of viewing objects of art-historical research and thereby completely redefines how we deal with our 'cultural heritage'. A self-organizing 'scholarly community' of art historians allows for user interaction not only as an additional, legitimate component in the generation of knowledge, but also transforms such interaction into a foundation for the organization and distribution of knowledge. For research, those hidden [kinds of] knowledge, based upon 'best practice' experience, occupy a fundamental position here. It is now those 'accompanying circumstances' of teaching and research projects, the 'gray values' and 'peripheral conditions', which – since they rest upon the experiences and the scholarly engagement of the researchers – characterize the backbone of scholarly knowledge. For example, the participants of a certain project on medieval religious architecture could learn something about the emerging difficulties or noteworthy aspects in the methodological treatment of the subject by making online-contact with the author of an other Master's thesis, which is stored online and which is based upon practical archival work. As the 'knowledge lifecycle' within such a system has virtually no expiration date, knowledge, once it has been obtained, remains immediately accessible for inter-institutional use – every Master's thesis/ dissertation is always also an *individual* work.

A possible future The consequences and opportunities arising from the art-historical knowledge gained through KM-technologies can only be touched upon briefly here:

- New evaluative possibilities with economic consequences: in our view, nothing speaks against offering the knowledge obtained in this way to institutions through personalized access possibilities. The classical role of the university is now supple-

mented with that of a 'knowledge provider'.

- Only now do new conceptions for the visualization of cognitive-conditioned contexts arise. It is no longer only the *natural scientist*, for example, the biologist, who 'presents' DNA – invisible to the human eye – through computer simulation. *Scholars of arthistory*, too, will demonstrate connections on the basis of applied computer graphics produced from organized databank queries. One example of this is the visualization concepts that enable databank information – itself literally abstract, but treated in conventional use as textual information – to become visible: three-dimensional environments in VRML or 'ThinkMap' navigational surfaces become the future tools of the 'image scholar', who makes some of the objects in his emerging discipline into methodological instruments.

ABOUT THE AUTHORS

Ingeborg Reichle Born 1970, studied Art History, Philosophy, Sociology, Archeology in Freiberg i. Br., London und Hamburg. Since 1998 active as scientific assistant at Prof. Dr. Horst Bredekamp's chair at the Art History department of the Humboldt University, Berlin. Intended Doctorate on the "Gender metamorphoses of Cyberspace". Further interests: art and new media, Cyberfeminism, Pictorial Science and Gender Research, new approaches on integrating WWW based Information Systems in the daily activity of teaching and research in Art Historical Institutions (Interactive Homepages). Since April 2001 project manager of the Berlin section of *PROMETHEUS*, a nationwide project network for developing new net based teaching and learning concepts (BMBF supported for three years)..

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