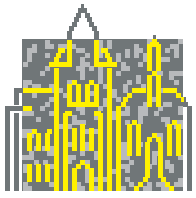
C. Haythornthwaite (The Univ. of Illinois, Champaign, US), W. Stucky (Univ. Karlsruhe, D), G. Vossen (Univ. Münster, D)
(Editors)

Conceptual and Technical Aspects of Electronic Learning

Dagstuhl Seminar 03191 – May 04 to May 09, 2003
Dagstuhl-Seminar-Report No. 378



SCHLOSS DAGSTUHL

INTERNATIONALES
BEGEGNUNGS-
UND FORSCHUNGSZENTRUM
FÜR INFORMATIK

ISSN 0940-1121

Herausgegeben von IBFI gem. GmbH, Schloss Dagstuhl, 66687 Wadern, Germany.

Das Internationale Begegnungs- und Forschungszentrum für Informatik (IBFI) Schloss Dagstuhl ist eine gemeinnützige GmbH. Sie veranstaltet regelmäßig wissenschaftliche Seminare, welche nach Antrag der Tagungsleiter und Begutachtung durch das wissenschaftliche Direktorium mit persönlich eingeladenen Gästen durchgeführt werden.

Gesellschafter:

- Gesellschaft für Informatik e.V. – Bonn
- TH Darmstadt
- Universität Frankfurt
- Universität Kaiserslautern
- Universität Karlsruhe
- Universität Stuttgart
- Universität Trier
- Universität des Saarlandes

Summary

Electronic learning and in particular web-based learning is a topic that has been attracting various communities for many years already. Both in Europe and overseas we see it becoming a major industry and applied both in educational institutes (such as schools and universities) and in companies for the initial or continuous training of employees. E-learning initiatives are increasingly being implemented to support educa-tion and workforce enhancement. It is estimated that in the United States alone the e-learning "industry" will grow from 2.3 billion dollars in 2001 to 23 billion in 2004; Western Europe has one of the highest per capita spending rates on continuing edu-cation and training. The online-learning share of training will grow from 20% to 40% against traditional classroom methods. Beyond that, universities are getting "virtual" and are discovering e-learning as a central paradigm for life-long education and learning.

Besides all the hype that the topic has recently received, there are aspects in the field which can already be considered "mature" (e.g., the decomposition of a learning platform into an authoring system, a learning management system, and a run-time system), standardization is underway (e.g., LOM, SCORM), and there are various conceptual issues that are worth considering in appropriate depth: First, e-learning, although fundamentally based on the use of computers, originally emerged in communities other than computer science. Indeed, e-learning has its roots in such fields as performance improvement, education, psychology, and others for which the use of a computer has long been of secondary importance, and for which even in times of the Web a computer remains merely one tool among others. Second, it is well recognized that e-learning, when applied in a company, can yield more than just learning effects; it can also contribute to knowledge preservation and thus to the development of an organizational memory. Third, there is a technological side of the picture which is where computer scientists can mostly contribute: For example, databases are used for storing, retrieving, composing, and configuring learning content, XML is under discussion as an exchange format for such standards like IMS and SCORM (as schema or DTD specification language or in new markup languages such as LMML or EML), and the processes that are involved in an e-learning scenario are sometimes already modelled as workflows.

A successful implementation of an e-learning system relies heavily on building the appropriate infrastructure and selecting the proper tools and technologies that work for the learner and the organization. Thus, it is also worth observing recent products and services, delivery methods, standards, and systems used today. Developing courses for e-learning requires more than technology and creativity. Is the particular topic at hand suitable for remote learning? What are the right electronic elements for the topic and for a student? It is reasonable to explore how to design effective course content, follow up with useful assessment and tracking approaches, and to learn to foster ongoing learner and teacher support and match learning styles with various delivery methods. It is also important to match the tools with the goals of the e-learning environment, recognizing that goals and outcomes can vary, e.g., whether the system is designed to broadcast information only, provide an individual stand-alone learning environment, or create a learning community of collaborative peers.

Given these premises, the seminar brought together a small, but nicely composed collection of people from computer science (databases, knowledge representation, al-gorithms, multimedia etc.) with experience, ongoing projects, or proven interests in e-learning as well as web-based learning, and blended these people with participants with less technological focus such as library sciences. As a result, talks were given on a wide range of topics that clearly showed the span which the field is currently having. The talks were as follows (in chronological order):

1. Rudi Studer: E-Learning and the Semantic Web
2. Hartmut Schmeck: Scenarios for Computer-Assisted Instruction
3. Radha Gupta: Web Teaching of Computing for Business
4. Peter Westerkamp: xLx a Platform for Graduate-Level Exercises
5. Gottfried Vossen: Learning Objects, Processes, Workflows: A Technical View of E-Learning
6. Jörg Desel: Activities of the GI SIG on E-Learning
7. Thomas Ottmann: Presentation Recording
8. Ralf Klamma: Multimedia Semantics for Electronic Learning Environments
9. Carsten Ullrich: ActiveMath
10. Wasim Sadiq: Workflow-Driven E-Learning Services
11. Stephan Diehl: Collaborative Learning and Distributed Experimentation
12. Christopher Hoadley: Design-based Research and Distributed Cognition in Socio-Technical Systems for Learning
13. Wolfgang Nejdl: E-Learning 2003 ff
14. Jörg Desel: Pros (and Cons) of E-Learning Approaches in Universities
15. Caroline Haythornthwaite: Social Networks and Distance Learners
16. Daniel Sommer: Quality Information Systems for E-Learning Applications
17. Gerald Friedland, Lars Knipping: Electronic Chalk
18. Peter Westerkamp: E-Learning as a Web Service
19. Victor Pankratius: E-Learning Grids
20. Cornelia Seeberg: Courses based on Modules
21. Martin Stein: VISUM

22. Kirsten Keferstein: Process-based Learning Object Management
23. Rob Koper: Learning Networks and Standardization Issues
24. Bernd Krämer: Education a la Carte

List of Talks with Documents (`/03191/Proceedings/`)

Due to the variety of e-learning related aspects that could be presented and discussed, the week served its purpose of crossing borders very well. In spite of the small number of participants, lots could be learned from each other, and fruitful clarifications be obtained. It remains to be seen what benefits such an open forum can drive home in the years to come.

Participants

- Desel, Jörg (KU Eichstätt-Ingolstadt)
- Diehl, Stephan (KU Eichstätt/Ingolstadt)
- Friedland, Gerald (FU Berlin)
- Gupta, Radha (Memorial Univ. of Newfoundland)
- Haythornthwaite, Caroline (The University of Illinois)
- Hoadley, Christopher (Penn State University)
- Keferstein, Kirsten (Universität Frankfurt)
- Klamma, Ralf (RWTH Aachen)
- Knipping, Lars (FU Berlin)
- Koper, Rob (Open University – Heerlen)
- Krämer, Bernd (FernUniversität in Hagen)
- Letz, Carolin (Universität Münster)
- Nejdl, Wolfgang (Leibniz Universität Hannover)
- Oberweis, Andreas (Universität Frankfurt)
- Ottmann, Thomas (Universität Freiburg)
- Pankratius, Victor (Universität Münster)
- Rojas, Raul (FU Berlin)
- Sadiq, Wasim (SAP Research Center – Brisbane)
- Schmeck, Hartmut (KIT – Karlsruhe Institute of Technology)
- Seeberg, Cornelia (TU Darmstadt)
- Sommer, Daniel (KIT – Karlsruhe Institute of Technology)
- Stein, Martin (Westfälische Wilhelms-Universität Münster)
- Stucky, Wolffried (KIT – Karlsruhe Institute of Technology)
- Studer, Rudi (KIT – Karlsruhe Institute of Technology)
- Ullrich, Carsten (Universität des Saarlandes)
- Vidyasankar, Krishnamurthy (Memorial Univ. of Newfoundland)
- Vossen, Gottfried (Universität Münster)
- Westerkamp, Peter (Universität Münster)