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Human Issues in Implementing eLearning Technology

J.UCS Special Issue

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Today, there is hardly any doubt that eLearning is a powerful and valuable extension to traditional educational initiatives. Thus, a fair amount of research and development (R&D) programs into the ways to improving the impact of eLearning have been carried out and are still ongoing. These programs traditionally focused on two different views on eLearning: technological issues on the one hand and educational issues on the other hand. This special issue on human issues in implementing eLearning technology is an attempt to combine these different views, since the most valuable results in eLearning will certainly be obtained when researchers and developers from as many different professions as possible come together and undertake joint efforts.

The contributions of this special issue deal especially with two topics, which are considered equally important for a successful eLearning initiative: the first is personalization regarding training and content and the second is considering issues such as motivation, acceptance, resistances and fears, or social requirements. Adapting content and training to the learner in aspects such as prior knowledge, previous experiences, contexts, access devices, needs or interests enhances the motivation to learn, makes the learner feel involved, and thus supports knowledge acquisition. Accordingly, the papers of this special issue are structured alongside the following categories, which are aiming at covering a preferably large number of issues that arise from viewing eLearning from the two distinct perspectives laid out above:

1. Methodology and Teaching Issues
2. Technology Issues and Experiences gained
3. Impact of eLearning on Education and Vice Versa

In the first category "**Methodology and Teaching Issues**" issues concerning different learning techniques are considered (peer-based learning, game-based learning) and the value of personality-aware teaching methods are examined. In more detail, the following topics are addressed:

Heidrun Allert, Christoph Richter and Wolfgang Nejdl, all from the Learning Lab Lower Saxony at the University of Hanover (Germany), describe in their paper entitled *Situated Models and Metadata for Learning Management* their approach on how to provide meta-data that allows identifying personalized learning resources in situ-

ated approaches, i.e. teaching approaches that deal with real world problems, which are possibly ill-structured. Special focus is set on how to consider social systems where human persons serve as sources for knowledge transfer alongside other resources such as technical services for communicating.

Maja Pivec and Olga Dziabenko from the FH Joanneum in Graz (Austria) examine teaching approaches that focus on learning by experience rather than on learning by studying. Learning by collaboration and game-based learning are two cases that are studied in more detail. Finally the game concept of UniGame, a game platform for community-based role play games is introduced and laid out in detail. Their paper is called *Game-Based Learning in Universities and Lifelong Learning: "UniGame: Social Skills and Knowledge Training" game concept*.

Edmond Abrahamian from the St. Louis University (USA), Jerry Weinberg from the Southern Illinois University at Edwardsville (USA) and Michael Grady and C. Michael Stanton both from the St. Louis University (USA) examine how user interfaces especially designed for certain personality types (using the Myers-Briggs Type Indicator) influence the performance of learners. In their paper *The Effect of Personality-Aware Computer-Human Interfaces on Learning* they present a substantial number of quantitative and qualitative results from their examinations and discuss consequences of their findings.

"**Technology Issues and Experiences**" presents software architectures for the compilation of personalized learning programs and the management of learner profiles and an experiences report from implementing and applying collaborative learning in an organizational context.

Andreas Schmidt and Claudia Winterhalter from the FZI, Karlsruhe (Germany) have entitled their contribution *User Context Aware Delivery of E-Learning Material: Approach and Architecture*. They present a general approach and architecture for a software system that supports the contextualization of learning resources by means of modular learning objects and applying semantic meta-data. They additionally describe the process of gathering information concerning the learning person (learner model) and how to find appropriate learning content by matching learner models against learning resources.

Floriana Esposito, Oriana Licchelli and Giovanni Semeraro have entitled their paper *Discovering Student Models in eLearning Systems*. The paper deals with the extraction and management of learners' profiles. They propose a system called Profile Extractor where the mode of operation bases on Machine Learning techniques and algorithms. By utilizing the Profile Extractor they argue to be able to build up a personalized education environment. Finally they show results from an evaluation of the accuracy of the Profile Extractor.

Thomas Flor from the DaimlerChrysler AG, Ulm (Germany) presents in his paper, which he has entitled *Experiences with Adaptive User and Learning Models in eLearning Systems for Higher Education*, an approach that has been undertaken at DaimlerChrysler to apply Computer Supported Collaborative Learning (CSCL) to promote learning effects. He describes the requirements that had to be considered throughout the process of implementing the given approach: from the original learning processes that had to be identified and structured to several learning scenarios that

needed to be supported (cooperative learning, distance learning, synchronous learning, etc.) and finally to styles and roles of user models used to represent learners that had to be modeled. He concludes with an evaluation of how the adaptive information system, which had been used to realize the given approach, met the requirements that had been found before.

"**Impact of eLearning on Education and Vice Versa**" deals with the differences between traditional seminar-based teaching methods and methods that are 'enhanced' by means of computer technology and with cultural and social issues and how they need to be considered in developing eLearning systems and eLearning content.

Maja Pivec and Konrad Baumann, both from the FH Joanneum, Graz (Austria), have entitled their paper *The Role of Adaptation and Personalisation in Classroom-Based Learning and in e-Learning*. The paper compares adaptability, knowledge mediation and knowledge flows in face-to-face classes to classes that utilize computer-based systems. An overview of aspects on adaptation and personalisation issues within these systems and some recent developments of intelligent tutors capable of expressing emotions are presented.

Edith Denman-Maier from the Donau-Universität Krems (Austria) presents in her paper *Intercultural Factors in Web-based Training Systems* an examination of the impact of intercultural issues on the production and presentation of eLearning content. After a thorough discussion of empirical research and a data analysis, hints and guidelines are presented for developing Web-based training modules for culturally heterogeneous user group. She finally presents a number of factors, which she believes cultural differences are discerned in. Edith Denman-Maier's contribution concludes the special issue.

The variety of topics covered by the contributions of this special issue hopefully provides readers with an overview of two important aspects of applying eLearning to teaching methods: technological issues, in particular how to provide learners with content and user interfaces that optimally adapt to their needs and requirements, and considering motivation, acceptance, resistances and fears, or social requirements when implementing an eLearning strategy.

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