The role of structure, patterns, and people in blended learning

Michael Derntl[*], Renate Motschnig-Pitrik[1]

Research Lab for Educational Technologies, Faculty of Computer Science, University of Vienna, Rathausstrasse 19/9, A-1010 Vienna, Austria

Abstract

Recently, much e-learning research has been devoted to producing e-content, describing it with metadata, and to constructing e-learning systems. Considerably less attention has been paid to integrating technology to improve the learning process in terms of depth and scope. In this paper, that gap is filled by considering learning support from a technological as well as from a socio-psychological perspective. Didactically, well-proven educational principles from the Person-Centered Approach are adopted to drive educational processes. Technically, a layered framework for deriving Web-based support from these educational principles is proposed. The study focuses on the contribution of visual modeling of blended learning scenarios, on their semi-formal description as patterns, and on the use of patterns as sources for user-centered Web support modules. The experiences and evaluations of one major academic course on Web Engineering indicate that blended learning has added value only when facilitated by educators with high interpersonal skills, and accompanied by reliable, easy-to-use technology.
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1. Introduction

E-content, its description by metadata, and its delivery via e-learning platforms employ the minds and pockets of many researchers, practitioners, and administrators. The current conception of the

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* Corresponding author. Tel.: +43 1 4277 39514; fax: +43 1 4277 9395.
  E-mail addresses: michael.derntl@univie.ac.at (M. Derntl), renate.motschnig@univie.ac.at (R. Motschnig-Pitrik).
  [1] Tel.: +43 1 4277 39515; fax: +43 1 4277 9395.

whole complex phenomenon of e-learning seems strong with regard to delivering learning content anytime and everywhere. Also, standard features of learning technology such as blackboard, whiteboard, forum, chat, and others, are technically well defined. However, much remains to be done in reengineering *learning processes* such as to exploit technology to a degree that surpasses mere representation, sharing, and delivery, by offering radically novel learning scenarios (Motschnig-Pitrik & Holzinger, 2002; Papert, 1999). These scenarios blend face-to-face and Web-supported learning such that the strengths of both settings can be leveraged and exploited. The current focus on learning technology in traditional universities indicates the significance of blended learning research for both society and economy.

Psychological and pedagogical theories highly agree on viewing lectures that serve only to transmit information to several students as not being very effective in the long run (e.g., Salmon, 2000). Knowledge that is not used tends to be forgotten very quickly. Rather, a form of learning that takes into account individual needs, interests and styles, and that encourages social learning, is preferred (Wenger, 1998). In that respect the hypothesis of this study (that is substantiated by experiments, which are described later) is that modern information and communication technology (ICT) has the potential to play a significant part in approaching more effective, in the sense of more profound and more persistent learning processes (Motschnig-Pitrik & Holzinger, 2002), while the lead in effective learning still stays with persons, their capabilities, and interpersonal values. Technology has proven to be capable of supporting persons with regard to information transfer as well as organizational and administrative issues. In this way it has contributed to providing increased room for self-directed, meaningful interaction in class and richer learning experiences.

Hence, the overall question and target is: How can learning in class and e-learning be blended for maximum benefit, i.e. for deep, persistent learning? Inevitably, this question has a socio-psychological and a technological response, which are highly intertwined. Unfortunately, current learning technology standards fall short in explicitly including guidance on using several of the added options that innovative learning scenarios call for. For example, the Institute of Electrical and Electronics Engineers (IEEE), one of the most influential standardization bodies in computer science, has drafted a standard for Learning Technology Systems Architectures (LTSA) (IEEE, 2001). Although the LTSA is a useful, generic, technical architecture providing a versatile toolbox, designing up-to-date e-learning systems should start from the social and didactical aspects of e-learning and e-teaching processes. As a starting point for deriving the opportunities of an advanced blended learning solution, the following characterizes the current state of e-learning research and practice:

- Although there are numerous individual studies on employing new media in education, a coherent theory on which to hold on in designing blended learning courses is missing. The current state resembles rather a phase of experimentation (Nichols, 2003): reports are mostly descriptive, experience-based, and often lacking cues on how to generalize the employed scenarios to enable transfer to other domains and contexts.
- Scenarios for blended learning need to be discovered and tested incrementally to acquire skills and familiarity in employing them. Reuse on a larger scale is not yet supported.
- Redesigning a course exploiting the benefits of novel learning technologies is essential but requires much thought, time, experience, and both didactical and technical skills to implement the design.