A Model of System Re-Configurability and Pedagogical Usability in an E-Learning Context: A Faculty Perspective

Jianfeng Wang, Mansfield University of Pennsylvania, USA
William J. Doll, The University of Toledo, USA
Xiaodong Deng, Oakland University, USA

ABSTRACT

Course management systems (CMSs) enable institutions to engage users efficiently, increase enrollment without major facilities investments, and serve geographically dispersed student markets on an ongoing basis. The full benefits of technology cannot be realized if faculty do not adopt the new technology and use it to achieve their instructional design objectives. From a faculty perspective, pedagogical usability of the software is an important factor affecting technology adoption and effective implementation. Pedagogical usability is measured using Chickering and Gamson’s seven principles of good educational practice. In a distance learning context, this paper provides an initial exploratory study of how faculty perceptions of CMS software characteristics like content re-configurability, interaction re-configurability, and modularity design help faculty implement good pedagogical principles. Additionally, a model is presented that links CMS software design characteristics like content re-configurability, interaction re-configurability, and modularity design with the pedagogical usability assessments of faculty. This model is tested using a sample of 56 faculty members using WebCT at a mid-western university.

Keywords: Content Re-configurability, Course Management Systems, E-Learning, Interaction Re-configurability, Modularity Design, Pedagogical Usability, System Re-configurability

INTRODUCTION

E-learning has become pervasive among educational institutions from K-12 school districts, to community colleges, and to universities. With course management systems (CMSs), these institutions are implementing successful strategies for engaging users, increasing enrollment capacity without making major facilities investment, and serving geographically
dispersed student populations. The benefits of e-learning include cost efficiency (Evans & Haase, 2001), easy and convenient 24/7 access from anywhere, scalability, and timeliness (Clarke & Hermens, 2001). The full benefits of e-learning cannot be realized if faculty do not adopt the new technology and fully use it to achieve their course design objectives. To achieve course design objectives, faculty need software that is pedagogically usable e.g., software that helps instructors implement good pedagogical principles in developing and implementing their courses.

Usability theory has been widely examined in computer systems and web-based systems (Nielsen, 1993; Pearrow, 2000; Shneidermann, 1998; Agarwal & Venkatesh, 2002; Palmer, 2002; Venkatesh & Agarwal, 2006; Venkatesh & Ramesh, 2006), but few studies investigate the relevance and applicability of usability concept in the design of digital learning environments (Zaharias, 2005). Agarwal and Venkatesh (2002) argue that the nature of the application and the type of user should be considered in developing a useful usability metric. The digital learning environment is a unique context for studying usability. In this unique context, each faculty member assumes the dual roles of application (i.e., on-line course) developer and system user. As course developers, they appropriate the functional and interface features embedded in the software to design the on-line course. As users, they use the system to communicate with students, monitor student activities, and evaluate student performance. Making an e-learning system usable basically involves two aspects: pedagogical usability and technical usability (Melis et al., 2003). Simply put, pedagogical usability aims at supporting the learning process while technical usability involves methods for ensuring a trouble-free interaction with the system. Technical usability is analogous to ease of use. While considerable attention has been focused on the ease of use construct (Lewis, 1995; Tilson et al., 1998; Raquel, 2001; Palmer, 2002), the construct of pedagogical usability of course management software has not been adequately addressed in the extant literature.

This paper focuses on the pedagogical usability of CMSs in an e-learning context. Pedagogical usability is defined as the extent to which the CMS software helps the instructor implement good pedagogical practices. The pedagogical literature suggests Seven Principles (Chickering & Gamson, 1987) of instructional design that are good teaching methods for traditional as well as e-learning courses. Technology contributes to pedagogical objectives if it encourages contact between faculty and students, facilitates cooperation among students, uses active learning techniques, enables prompt feedback, emphasizes time on task, helps communicate high expectations, and respects diverse talents and ways of learning (Chickering & Ehrmann, 1996).

If the power of CMSs is to be fully realized, e-learning technology should be designed to help faculty achieve these pedagogical goals. Based upon the information systems and e-learning literatures, this study provides an initial exploratory model of pedagogical usability of CMSs from a faculty perspective. This model links CMS software design characteristics - content re-configurability (Horton, 2000; Skyrme, 2001; Wild et al., 2002), interaction re-configurability (Kilby, 2001), and modularity design (WebCT Website at www.webct.com; Markus et al., 2002) - with pedagogical usability. This model is tested using a sample of 56 faculty members from an Ohio university.

THEORY DEVELOPMENT AND LITERATURE REVIEW

The notion of usability is a key theme in the human-computer interaction (HCI) literature (Zhang & Li, 2005). Research in the HCI tradition has long asserted that the study of human factors is critical to the successful design and implementation of technological devices. The overarching goal of a majority of the HCI work...
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