Chapter 4
The Evaluation Cycle Management–Method Applied to the Evaluation of Learning Management Systems

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ABSTRACT
The chapter deals with a complex decision-making problem, the selection and evaluation of Learning Management Systems (LMS) in which several objectives - referring to the definite group of users - like social, technical, environmental, and economic impacts, must be simultaneously taken into account. We introduce Evaluation Cycle Management (ECM), a support methodology aimed at the evaluation of options that occur in the decision-making processes. ECM is based on Multi-attribute decision making (Criteria Evaluation) and Usability Testing (Usability Evaluation). The Multi-attribute decision making in the first phase of ECM presents an approach to the development of a qualitative hierarchical decision model that is based on DEX, an expert system shell for multi-attribute decision support. The second phase of ECM is aimed at Usability Testing on end users. ECM illustrates its usefulness by showing its main features and its application to the above problem. It is based on the theoretical and practical expertise related to the quality and usability assurance of LMS.

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INTRODUCTION AND RELATED WORK

Considering the abundance of e-learning systems that have offered education over the Internet during the past decade, it is not surprising that there has been growing interest in identifying design principles and features that can enhance user satisfaction. User satisfaction with technologies related to distance and collaborative learning applications has been found to be significantly associated with usability, that is, the effectiveness, efficiency and satisfaction that it gives to its user in a given context of use and task. The usability of an educational environment is related to its pedagogical value (Kirkpatrick, 1994) and evaluation of its usability is part of the processes of establishing its quality. In the literature, there are numerous recommendations for the design of pages, text, graphics, and navigation in Learning Management Systems (LMSs), but in spite of that, it is still recognized that “severe usability problems are present and common” (Brinck, Gergle & Wood, 2002). However, despite the increased awareness of these problems when adopting internet-based education (Johnson & Hegarty, 2003) the usability of e-learning systems has still not been sufficiently explored and solutions not yet provided.

These are some of the realizations that led us to perform the case study described in this chapter and to analyze the results. The case study was undertaken as part of an EU project centered on the issues of introducing internet-based education in a region that suffers from a low level of business-oriented usage of the Internet and related e-services together with a relatively high level of unemployment. We found the environment and the context of this study extremely suitable for an evaluation and assessment of the usability of the Learning Management Systems, and to try to identify the “threshold of acceptability beyond which users can begin to interact productively and voluntarily instead of simply acting and reacting” (Hémard, 2003).

The usability of a Learning Management System is often perceived to be the province of the technical expert rather than the content expert; however, technical knowledge is insufficient when it comes to designing and testing systems intended for e-learning. A recent survey (Pulichino, 2004) shows that e-learning practitioners perceive usability a key factor in e-learning systems planning and use. The results of that survey indicate three aspects (Inversin, Botturi & Triacca, 2006): (a) usability is an essential consideration when designing e-learning systems; (b) e-learning systems and applications should always be tested for usability; and (c) e-learning systems and applications effectiveness can be greatly enhanced through user-centred design methodologies.

From the perspective of LMS selection, adoption and maintenance, the investigating the usability of LMS can be very interesting also for at least three reasons: (1) it may reveal usability breakdowns and provide indications for enhancing the application itself, by creating workarounds or by fixing the code – a possible alternative with Open Source; (2) it allows LMS manager to create guidelines for course authors and instructors that are actually supportive for their practice and focus on their problems instead of being (only) general introductions to the tool; (3) it allows user-oriented instead of system-oriented comparison and assessment of LMSs.

There are different methodologies for evaluating the usability of e-learning systems and applications. Basically they fall within two main categories: (a) usability inspection methods, and (b) empirical testing. Usability Inspections methods, also called expert review methods, include a set of methods based on having expert evaluators instead of final users inspect or examine usability-related aspects of a user interface (Cato, 2001, Holzinger, 2005). The main systematic inspection techniques are: Heuristic Evaluation (Cato, 2001), Cognitive Walkthrough (Brinck, Gergle & Wood, 2002) and Formal Usability Inspections (Holzinger, 2005). Empirical testing methods, also
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