Chapter 12

Identifying Student Usability Needs for Collaborative Learning Environment Design

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ABSTRACT

Performance of Web-based collaborations depends not only on pedagogical strategies but also on the effectiveness of e-learning systems. The factors that may help designers in creating collaborative environments acceptable to users are considered. It is shown that usability needs may differ among students attending the same course who have similar technical skills, and it is difficult to determine average user requirements. The research is based on two case studies of students evaluating the same environment. As an experimental result, it is stated that usability requirements may be influenced by learning style preferences, and therefore student groups may be created. Some indications concerning identification of usability needs are presented.

INTRODUCTION

One of the most important factors for measuring the usability of an educational system is learner satisfaction. Identification of portal features, obtaining student approval of the environment in a specified context of use, may be of crucial significance in attaining pedagogical goals as well as building sustainable collaborative communities. Software designers should take into account usability aspects in an educational setting. Development of internet technologies enables the inclusion of student collaboration as part of e-learning systems, where students may exchange ideas, share knowledge or experience, and discuss problem solutions. Students’ attitudes towards participating in collaboration may depend significantly on their acceptance of the collaborative environment and, particularly, on the degree to which it is tailored to meet their needs. Recognition of user requirements at the early stage of development of the portal is the best way to ensure student satisfaction. The learner’s role in the process cannot be overestimated. Tailoring the software to user requirements may be difficult in the
case of different student needs and preferences. Dividing them into groups with similar requirements may help to solve the problem.

In the paper, we consider usability aspects of educational software. The main goal is identification of factors that may help in building collaborative environments which are acceptable to users. The focus is on the student role in creating user-friendly and fully satisfactory portals and, in particular, the significance of the evaluation process. We discuss methods that enable us to discover student requirements. We consider finding groups with similar usability preferences. Our aim is to indicate methods for identifying the factors that are the most important for students and that should be taken into account during the process of creating collaborative learning environments. We propose to use learning styles as the determinant for dividing students into groups. The research is based on two case studies of students’ assessment of a system that was used during international collaboration.

BACKGROUND

According to International Organisation for Standardization (1998), software usability may be defined as the extent to which the system can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. Kukulska-Hulme and Shield (2004) suggest that good usability of computer systems can be only achieved by understanding the psychological, ergonomic, organisational and social factors that determine how people operate. They emphasise the significance of such aspects as satisfaction and enjoyability. Preece, Rogers and Sharp (2002) additionally stress the role of the user’s evaluation of prototypes and existing systems. Bell, Zaitseva and Zakrzewska (2007), in turn, present the evaluation of software as crucial in achievement of sustainability of online learning communities.

Squires and Preece (1996) observed that the usability features of educational software have a big impact on achieving educational goals and that researchers do not give enough attention to the fact. Usability of online learning systems has become an object of research in recent years, but there is still no standard methodology for evaluating learning applications (Ardito et al., 2006). According to Nielsen (1993) the usability of software is usually connected with such features as learnability, effectiveness, efficiency, robustness and user satisfaction. Nielsen (1994) formulated software usability heuristics, which Dringus (1995) proposed to use for evaluating interfaces of applications without any modifications. Nielsen’s (1994) heuristics, developed to assess user requirements of interactive systems and revised by Schneiderman (1997), were used by Parlangeli, Marchigianni and Bagnara (1999) to evaluate usability of e-learning applications.

Squires and Preece (1999) emphasised the necessity for changes in proposed heuristics to fulfil learners’ requirements. They proposed an adaptation of Nielsen’s heuristics by using socioconstructivist principles (Philips, 1995; Soloway et al., 1996), such as: matching between designers and learner model, navigational fidelity, appropriate levels of learner control, prevention of peripheral cognitive errors, understandable and meaningful symbolic representations, supporting personal approaches to learning, strategies for cognitive error recognition, diagnosis and recovery, matching with the curriculum.

Quinn, Alem and Eklund (1999) presented a method of evaluating e-learning systems which takes into account design factors and acceptance factors by considering instructional goal and content, learning tasks and aids, and assessment, together with level of motivation to use the system, level of active participation entailed, quality of learning support and level of user satisfaction.

Usability is the feature that decides how the specified goals are achieved. Nogier (2007) defined it as the capacity of an object to be easy

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