Chapter 7.12

Disability Standards and Guidelines for Learning Management Systems:
Evaluating Accessibility

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ABSTRACT

Currently, the great majority of institutions of higher education use Learning Content Management Systems (LCMSs) and Learning Management Systems (LMS) as pedagogical tools. In order to make these systems accessible to all students, it is important to take into account not only educational standards, but also standards of accessibility. It is essential to have with procedures and well-established method for evaluating these tools, so in this paper we propose a method for evaluating the accessibility of LCMSs and LMS based on a consideration of particular accessibility standards and other technological and human aspects.

The method application is for all LMS, in order to illustrate the effectiveness of the evaluation method, we present a case study over the widely-used LMS Moodle[1]. In the case study, the accessibility of Moodle is evaluated thoroughly from the point of view of visually-impaired persons. The results obtained from the case study demonstrate that this LMS is partially accessible. The evaluation shows that the tool provides poor support to the authors of accessible educational contents.

INTRODUCTION

Information and Communication Technology (ICT) plays a key role in people's daily lives (Rößling G. et al, 2008), a fact that is equally true of people with and without disabilities. Over the past few years in the education sector and, more specifically, in institutions of higher education, Learning Management Systems (LMS) and Learning Content Management Systems (LCMSs) have become extremely popular pedagogical tools for teachers and students. Such is the current popularity of LMS in these institutions, in fact, that LMS are oftentimes the only tool given to students for communicating with peers and teachers or for accessing particular learning resources. Therefore, the negative impact of an inaccessible LMS on the learning experience of students with disabilities would be large indeed. In order to provide equal opportunities to all students, it is necessary to improve the learning environment by removing all barriers to accessibility. LMS, LCMSs and their learning contents should be available to all students and teachers, including those with disabilities and regardless of their particular accessibility needs.

In the effort to make software completely accessible to all types of users, it must be taken into account that certain individuals require the use of Assistive Technologies (ATs) such as screen readers, refreshable Braille displays, speech synthesizers, magnifiers, adaptable keyboards or voice recognition software in order to see, hear, move or interact with the system and its contents. In addition to covering the widest range of user abilities, software should also take user preferences and learning styles (*e.g.*, visual, auditory or tactile) into account. The development of software in this way would allow all users, not just individuals with disabilities, to universally benefit from system contents (Moreno, L. et al, 2008). Therefore, in order to ensure the achievement of this goal in the context of institutions of higher learning, it is necessary to design and develop LMS and LCMSs according to standards that facilitate

universal access and, at the same time, promote correct technological growth (Fichten, C.S., 2009). Moreover, evaluations of the accessibility of these LMS and LCMSs and the certification of their compliance with accessibility standards should also be required.

In the following section of this chapter, specific technologies, accessibility standards and previously published work regarding LMS accessibility is discussed at length. In the third section, a new method for the evaluation of the compliance of an LMS with previously examined accessibility standards is proposed. This evaluation method is then put into practice in the fourth section for the Moodle LMS whose accessibility, specifically for visually-impaired individuals, is tested by an accessibility expert and a visually-impaired end-user (with the assistance of JAWS screen reader). Finally, the fifth section presents briefly general conclusions from the case study as well as areas for future research.

BACKGROUND

For the present study, we have considered a wide variety of previous published works on accessibility standards and regulations, LMS incorporating accessibility requirements into their design, as well as studies of LMS accessibility evaluation methods. With regard to this last point, the user-centered design (UCD) approach is considered and developed here.

E-Learning and Accessibility Standards

In order to make educational resource applications and web sites universally accessible for all users, not only educational standards like the Sharable Content Object Reference Model (SCORM), but also accessibility standards like the Instructional Management System (IMS) guidelines for developing accessible learning applications[2], the World

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