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ATUTOR SOFTWARE AND MEDICAL EDUCATION:
Experience of Using an Open source Learning Software

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ABSTRACT

ATutor is an open source web-based learning management software which has been designed for institutional e-learning management including content creation, learner's activity management and tracking learning objectives in a social networking environment, using various online communicative tools. This paper describes how this software is used in a medical university, explaining boundaries and challenges. This is a case-study focusing on preparation of content for students of higher education institutions in Medical Sciences. The focus is on supplementary resources for students and continuous medical education. Despite the initial resistance and challenges of using open source software without technical supports, the process was progressive and lead to development of education. Many conflicts and challenges were resolved in the first year of the study while some features of the software proved to be incapable for medical education learning material and usability rate in some tools was very low. Despite boundaries and difficulties in moving toward electronic learning for medical education, using open source softwares such as Atutor is possible and beneficial. Customizing the software, preparation of IT infrastructure and access to a technical team to develop and manage the virtual environment of e-Learning is essential. Otherwise the system would not widely be accepted by users; this raises problems that lead to strongly negative feedback from tutors and learners.

Keywords: Medical education, electronic learning, open source software.

INTRODUCTION

In 2006 a software contract for automation of continuous medical education was made in Mashhad University of Medical Sciences. It led to the subsequent research which is described in this paper: explaining different aspects of using an open source web-based learning management system for medical education. This experience may help other medical education developers know the challenges they may face during using such systems in addition to appreciating their every component for more appropriate online education design.
E-learning can be used in various target groups of medical education, including undergraduate studies, postgraduate and residency courses and continuous medical education. Some of these seem more acceptable.

Currently, more evidence is available for effectiveness of using electronic learning technologies. Therefore, continuous medical education is one of the approved target groups. It covers private clinicians who work in regional health centers or education of staff practice in hospitals or health administration centers, away from academic institutions. There are many studies, confirming this method of education for continuous medical education, as effective as "face to face" learning, if designed and administered properly (Smit 2007, Wong 2010, Critchley, 2009). Moreover, some other educational groups benefit from this method of education as

well: "The experience so far with this resource has been positive, and it seems to be effective in improving resident competency" (Kang et all, 2009), the advantage of this method of education is proven in delivery of learning material and students' learning assessment (Maisonneuve, 2009).

Aims of This Manuscript

There are some publications describing how to use open source softwares for e-learning. However, few studies focus on particular web-based softwares to discuss different problems that arise during the integration of this new model of education with the routine traditional system of education. This issue is beyond challenges of designing web-based educational contents and managing learners via any standard learning management system (LMS).

ATutor software is described by its developers as follows: "ATutor is an Open Source Web-based Learning Content Management System and social networking environment that is designed with accessibility and adaptability features", (ATutor official website, 2010). Instructors can install or update it in a few minutes, design themes (graphic interface) to give their interface a unique face, and easily select among its functions, including various capabilities in a modular platform. Tutors can prepare web-based instructional content, in a structured and categorized manner, and offer it online to the learners. Therefore, students learn in a user friendly environment using many communicative tools of the software.

First of all, it seems very exciting that students can stay home and learn what they are supposed to learn in classrooms, using their own personal computers. Furthermore, it seems cost-effective for education management to reduce costs of preparing and maintaining educational spaces for learners inside the institute. It would also reduce cost of tutor's salaries, by preparing excellent learning content packages and administering them for many times in various course modules for large groups of learners. Electronic learning content has the main characteristic of being reusable and shareable once it is prepared on the basis of a standard such as "Sharable Content Object Reference Model" (SCORM), (MUMS website, 2010).

But in practice, it is not very easy to do so, as many problems occur when stepping into this field one after another. According to our experience, these problems can be categorized into two main groups. The first is technical and the other is cultural. In this paper the main aim is to discuss some major technical challenges in using particular open source learning management systems such as ATutor software. But initially a common disbelief is discussed briefly in the next paragraph.

"If I prepare all my classroom lectures in multimedia format, what would be my duty then, and no student will attend my classes, afterwards". This is a complaint many tutors in our university make. In addition, reports were received from students who are dissatisfied with the new methods of education with less access to tutors. ATutor software has various capabilities in addition to content delivery like all learning content management software (LCMS). However, the key feature of any LCMS software is presenting content in html-based or Flash-based formats. This content can be inserted in WebPages or be stored in storage sections to be downloaded. These features enable students to have access to learning materials whenever they need via any computer connected to the web. In fact, some students had some problems in accessing the content due to low access to broadband internet at home. Moreover, some other difficulties emerged including: lack of flash plug-in for movies according to restricted access computers, unavailability of headphones in shared computers inside libraries and finally unavailability of computers per student. These issues led us to arrange work on the university ICT infrastructures to promote better technologic readiness for this purpose.

In case of comparing the following two types: flash-based and html-based content; overall capabilities of html-based content in theory are better. This type of content can easily be edited word by word at any time and it can be linked to many internal and external resources including multimedia and research papers (hypertext feature). It can be full of images, large contents can be prepared in small files, plus they are easily downloaded

and opened without any plug-in. In Atutor software like many other LCMSs, any word can be linked to a particular dictionary to show definitions. Flash-based content has few of the above-mentioned features in comparison with the other type of content. But it is more willingly accepted by students in spite of difficulty in downloading larger file sizes.

Owing to these facts, we initially focused on the html type of content, but two problems occurred. First: few tutors had their content ready in text and most of them had PowerPoint slides, as the only ready learning material used in classroom. Therefore, most instructors, following availability of slides, tended to add narration to their slides to produce flash-based audio-slide contents. We tried to resist it, but then we found out that even text-based contents are added to WebPages as simple text pages without any of the above-mentioned features, making eBook-like contents boring. Moreover, reading simple text via computer screen is not suitable for learners. It was the result of several problems including poor computer skills, lack of time and lack of insight about advantages of such features.

Moreover, content delivery is a major part of e-learning instruction via LCSMs, but Atutor software is likely to develop a good communicative environment among students and their tutor. It is obvious that providing content for students without further support and mutual communication will decrease student motivation and involvement in course and reduce learning outcomes, (Moodle office website, 2010). Therefore, we tried to use ATutor communicative features, including forums, chat rooms, surveys and quizzes, blogs, internal messages, announcements and projects. However, the proportion of acceptance and utilization of these features by tutors and students was not the same. While tutors in basic science disciplines actively participated in such activities, clinical tutors had little time for these collaborations and considered electronic learning a way to make more time to spend in clinics.

The most frequently used features were Chat rooms, Messaging and final Announcements, while the least effort was put into activating and using forums and blogs. The Project feature then Survey and Quizzes were accepted and used, respectively. Apart from all these difficulties and problems, this method of education was increasingly used by tutors and students; average users of the system reached to over one hundred users a day (2.5 percent of students) and the database of the content rose to 300 GB.

A major complaint stated by many instructors about e-learning activities was due to overall acceptance of it for medical education. They argued that medical education is practice-based and students have to participate in real environments such as clinics, laboratories or operating rooms. While, this is confirmed that e-learning can help medical education if it is administrated appropriately with good content design and administration (Sajeva, 2006).

However, initially, tutors' resistance to this issue was very strong, therefore, many workshops and seminars were held and booklets were handed out to change disbeliefs about the significance of this method of learning.

Besides, ATutor is not a LCMS to be designed specifically for medical education; subsequently many customizations were needed according to the available modules or additional programming. One of the most accepted and popular added module was photo gallery that was innovatively used to create online atlases of medical images in various disciplines after customization and adjustments. Another required feature was design and preparation of patient management problems protocols (PMP), that user-response sensitive pages would be delivered to make an interactive learning content. Nonetheless, Atutor is weak in integration of surveys and quizzes between contents. So manual coding and programming was needed for this purpose, unlike Moodle LCMS software, that is very appropriate for integration of assessments and activates among learning content, (Moodle official website, 2010).

DISCUSSION

Due to lack of funds, access to technical support and uncertainty about the success of the new methods of education, we moved toward using an open source learning management software, ATutor, for web-based e-learning. Problems were more than expected, but the overall evaluation reveals that if a technical and trained team is available, medical universities can start to manage web-based education. However, it should be remembered and understood that electronic learning in medical education needs to be defined properly and administered for the wisely selected learning objectives. Electronic learning content includes planning of objectives, subsequent assessments and appropriately justified activities. In addition, it should keep students involved during learning process, by administering forums, blogs, projects and chat rooms controlled by tutors. Most importantly, tutors should be responsive and available to learners to prevent unpleasant feeling of confusion inside huge contents and duties without teacher's support.

CONCLUSION

Authors believe that adding E-learning to medical education is a time consuming process. Proper setup and selection of strategies, softwares and infrastructures are the preliminary needs. However, each higher education institution in field of biomedical sciences with any culture, infrastructure, type of information and literacy level can benefit from it by using appropriate methodology for the targeted groups.

Although, Atutor is not known as much as Moodle is (Sajeva, 2006), it seems flexible enough and it can be customized by expert technical developers to suit and meet minimal needs and expectations of the institution. Using a SCORM based LCMS is a critical point that should NOT be ignored. Since, it is the only possible way to transfer contents from one LCMS to the others. During e-learning administration, due to varied needs and expanded area of practice and objectives, transfer from one LMS to another may become necessary. Although, ATutor can only export core learning content to other SCORM based LCMS; and other features of the course, such as forums, threads, quizzes, user tracking and announcements and records will be missed. All of these systems are under development and still many challenges are faced that we hope the next version of LMS software to be improved (Mazzoleni 2009). For example, both Moodle and ATutor had few features for integrating assessments within content in earlier versions until the current ones. So, more studies should be done to understand appropriate approaches for learning objectives in detail to make LCSMs more compatible for online medical education.

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