Enhancements in Blended e-Learning Management System

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Abstract—A learning management system (commonly abbreviated as LMS) is a software application for the administration, documentation, tracking, and reporting of training programs, classroom and online events, e-learning programs, and training content (Ellis 2009). (Hall 2003) defines an LMS as \"software that automates the administration of training events. All Learning Management Systems manage the log-in of registered users, manage course catalogs, record data from learners, and provide reports to management\". Evidence of the worldwide spread of e-learning in recent years is easy to obtain. In April 2003, no fewer than 66,000 fully online courses and 1,200 complete online programs were listed on the TeleCampus portal from TeleEducation (Paulsen 2003). In the report \" The US market in the Self-paced eLearning Products and Services:2010-2015 Forecast and Analysis\" The number of student taken classes exclusively online will be nearly equal (1% less) to the number taken classes exclusively in physical campuses. Number of student taken online course will increase from 1.37 million in 2010 to 3.86 million in 2015 in USA. In another report by The Sloan Consortium three-quarters of institutions report that the economic downturn has increased demand for online courses and programs.

Keywords—LMS, Interactive Materials, Exam Centers, Learning Outcomes

I. INTRODUCTION

METHODS of learning have been developed over years, nowadays, computer and internet techniques have become significant tools in the learning process.

(Koper, R. 2004) defines two application areas for semantic web educational uses, those are:

1. Software agents that support teachers in performing their tasks in flexible online educational settings.

2. Software agents that interpret the structure of distributed, self-organized, self-directed learning networks for lifelong learning. The resulting information is used by learners to help persons them perform their tasks in this context more effectively and efficiently.

A learning management system (commonly abbreviated as LMS) is a software application for the administration, documentation, tracking, and reporting of training programs, classroom and online events, e-learning programs, and training content [1].

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[5] divided the progress of the Information and Communication Technology in the area of e-learning into two stages. The first stage, which we are now completing, is what might be thought of as the electronic classroom. The physical environment in which teaching and learning occurs is being replaced with an electronic classroom, but the process of teaching is very much the same. In the second phase, however, we will begin to use technology in new ways, to advance beyond what was possible in the classroom.

The uses of LMS are either building & presenting learning courses including content and interaction in a manner supportive to the traditional learning in classrooms or fully so as to dispense with traditional learning methods. During the last decade, LMS has been widely used in many educational establishments around the world; there are now many suppliers to provide LMS services. However, LMS still needs to add more enhancements in order to achieve the goals for which it was established. Social interaction between students and instructors or between students and each others, interactive labs, exam management, student-progress tracking and Learning Outcomes are still areas of concern which needs more investigation. This paper is concerned with discussing some aspects that would improve the above points..

II. INTERACTIVE MATERIALS

A study on a number of colleges that are concerned with learning applied sciences showed not to accept the use of distance learning techniques by teachers because of the inability of such techniques to cover the practical aspects of the study in those colleges, the main complains were always that student would not be able to attend labs and workshops as well as that teachers cannot be able to describe the practical aspects associated with the lessons. This paper emphasis the significance of utilizing the multimedia programming to create two types of interactive learning material as follows:

A. Virtual Labs

A virtual lab is simply an interactive screen representing a simulation of a real experiment; the results of the experiment are varying according to specific considerations regarding the details related with the operation. The advantages of such a method are:

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1- Students can carry out their experiment without the need to attend at the laboratory.

2- Damage of laboratory devices and equipment is completely avoided.

3- To avoid students of getting hurt when trying to get close of a dangerous experiment.

4- Students can subsequently have visual-recordings of the experiments they carried out so that they can later review them off-line.

5- The evaluation of the students can be carried out by the computer in a relatively-small time.

B. Interactive presentations

As mentioned above, describing practical aspects of lessons may need special skills and effort from the teacher, that's why studying such lessons via distance learning systems, will not be sufficient. Interactive presentations are 3D animated images, that may be supported by voice, the student will have the ability to animated the images in a way that make him understand the related details, other advantages of using presentation are listed below :

1- To present the information in an exciting way for students.

2- To reach locations those are impossible to be reached, such as the case of getting inside an internal combustion engine or inside a blood vessel.

III. EXAM MANAGEMENT

Exam management in most LMS products regards the aspects of creating question pools, creating exams with their questions be randomly selected according to specific criteria and grading the students' exams. The area of concern of this paper regarding this point is how to get the exam. While the traditional way is getting the electronic exams via the normal web pages on the system, this paper emphasizes the advantages of integrating the LMS system with an exam center management system that enables the students to reserve the time and exam center to get the exam, respecting the constraint of exam center capacity at the specified time, the exam center is equipped with a secured browser application that has the following advantages:

1- In order to achieve security, student can not access any application on the machine on which he is getting the exam (client machine), except for the exam page

2- We found out in our practical application that many exam centers don't have internet connection that's why we developed a new technique that enables students' answers to be saved continuously on the client machine in an encrypted format, so that they can subsequently be submitted to the server from any client machine where an internet connection is available, this technique also helps in cases of unplanned stopping such as electricity failure or network disconnection, the answers can even be submitted to the server from another client, see figure1.
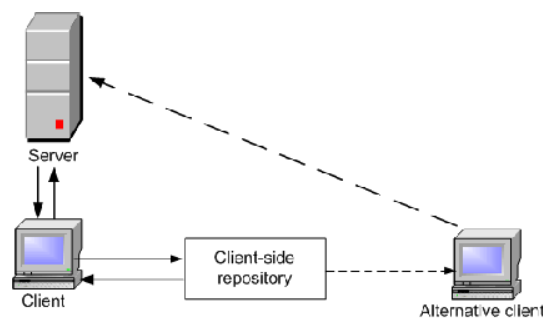

Fig. 1 Exam answers mechanism in exam centers

3- The IP addresses of the Exam center machines are known by the LMS server so that the exam-taking application can not be run from any other client.

IV. STUDENT PROGRESS TRACKING

For many purposes, most LMS service suppliers see that it's significant to enable users of getting information about student's progress in the different activities such as sharing in forums, lectures attending, assignment presenting and exam attending, the novel in this paper is to provide the tracking of student's progress in reading the e-content, this feature may depend on getting the time spent by the user while reading each section in the course content, a progress indicator may display a number that represents the percentage value of the read content, the content player will also continue displaying the pages from where the student stopped.

V. INTERACTIVE COMMUNICATIONS

Another weakness of the distance learning systems is the lack of interactive communication between students and teachers and between students and each others. This paper emphasis the significance of social interaction in the learning process by suggesting several methodologies as follows:

A. Online text chatting

Online text chatting can be usefully utilized in LMS systems to help students in communicating with technical support responsible or their teachers, the advantage of such a communication method is that it provides an instantaneous response to the student which very useful in the cases of urgency or problem solving, the disadvantage of such a method remains in that it may has a bad effect on the overall performance of the system and has to be used very wisely by enabling it between students and teachers whereas restricting it between students and each other's.

B. Virtual classrooms

Virtual classrooms (commonly abbreviated as VCR) is one of the fundamental elements of the LMS, by means of VCR, instructor can present his/her live lectures using audio and video streaming and whiteboard. VCR enables the instructor of administrating the students' attendance and sharing in virtual room using several utilities such as: asking for spoken conversation, permitting of spoken conversation, stopping the

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current spoken conversation and etc. Instructor can also administrate and show lecture resources such as: slides and audio and video files. VCR enables students of presenting their comments via spoken conversation and text chatting. VCR enables shared browsing with both instructor and students. VCR enables the instructor of recording the live lecture, so that student may sub sequentially review them off-line.

The advantages of using VCR can be listed as follows:

1- It is an interactive, live and multi-channel learning.

2- It assures the comprehension of the students via several interaction tools.

3- It is a good alternative for human interaction.

4- It is a good collaborative learning tool.

C. Discussion forums

Discussion Forums provide a suitable environment of indirect interaction between the students and the instructor and between student and each others. The Discussion Forums enable the instructor of controlling the level of sharing in forums; it also enables creating sub forums for the groups of cooperative learning groups beside the general course forum and other many features related with forums.

D. Internal mail

The Internal mail provides all the main functionalities of the e-mail via which user can send and receive electronic mails, attach different types of files with messages to be sent, the contacts list of instructors and enrolled students and search in mails subjects.

E. SMS notifications

LMS system has to have the utility of sending notification SMS's to one or more students as it's an extremely smooth way of communication, the SMS messages may be used in the following cases:

1- Warning of any undesirable behavior of a student.

2- Reminding of the important dates and events.

3- Announcing the result of the examinations.

4- Sending private information to the student upon his request such as his username or password.

F. Instant Internal messages

This utility enables the administrators and teachers to send important messages to all online students, so that the sent message is instantaneously displayed at any page the student may open, the advantage of using such a method is that it's very fast, dedicated only to the online student and free.

VI. MANAGING LEARNING OUTCOMES

Learning outcomes and 'aims and objectives' are often used synonymously, although they are not the same. Adam (2004) notes that 'Aims are concerned with teaching and the teacher's intentions whilst learning outcomes are concerned with learning' and Moon (2002) suggests that one way to distinguish aims from learning outcomes is that aims indicate the general content, direction and intentions behind the module from the designer/teacher viewpoint.

In the LMS proposed in this paper, considering the results of the Learning Outcomes of a student is a mean of measurement by which administrators/instructors can get an image of the student's performance in the courses he studies. A course-outcome is supposed to be a grouping of several course activities.

Managing Learning Outcomes is a utility that enables the administrator/instructor of grouping certain course activities under named entities called "outcomes, as described in the following section.

A. The Main Objectives of Managing Learning Outcomes

1- Defining main and subsidiary learning outcomes for courses.

2- Defining the activities of each subsidiary learning outcome.

3- Providing detailed reports that cover the students' achievement of the learning outcomes so that they can be used as means of evaluation.

VII. CONCLUSION

There are many aspects by which LMS educational environment can be enhanced, so that it can be a good simulation for the traditional learning, the aspects that were mentioned in this paper are:

4- Interactive materials.

5- Exam management.

6- Student-progress tracking.

Interactive communications.

REFERENCES

[1] Ellis, Ryann K. (2009), Field Guide to Learning Management Systems, ASTD Learning Circuits.
[2] Hall, B. (2003). New Technology Definitions, http://www.brandonhall.com/public/glossary/index.htm
[3] Morten Flate Paulsen (2003), Experiences with Learning Management Systems in 113 European Institutions, Educational Technology & Society
[4] Koper, R. (2004b). Use of the Semantic Web to Solve Some Basic Problems in Education: Increase Flexible, Distributed Lifelong Learning, Decrease Teacher's Workload. Journal of Interactive Media in Education, 6.
[5] Downes, S. (2004a). From Classrooms to Learning Environments: A Midrange Projection of E-Learning Technologies. College Quarterly, Volume 7, Number 3.
[6] Adam, S. (2004). Using Learning Outcomes, Report for United Kingdom Bologna Seminar 1-2 July 2004, Heriot-Watt University (Edinburgh Conference Centre) Edinburgh. Scotland.
[7] Moon, J. (2002). The Module and Programmes Development Handbook (London, Kogan Page).