# E-learning Tools and Technologies in Education: A Perspective

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## *Abstract*

*Many e-learning tools are currently available for using in education. E-learning tools can provide training and education to large number of students with diverse cultural backgrounds and educational levels. However, e-learning could be failed in education when overestimating what e-learning can accomplish. Some people normally do not understand the weaknesses and limitations of e-learning and some of them may expect too much. In this paper, we review the different e-learning tools such as MOODLE, and Blackboard. We also comment on the most important aims of each tool and analyze the advantages and disadvantages. From this analysis we obtain a global view of the current and future tendencies of e-learning tools and therefore we provide possible important comments for using e-learning tools such as MOODLE in the classroom. Upon to our teaching experience, MOODLE is effective in the e-learning development. Authors and practitioners showed a greater preference for MOODLE over Blackboard. However, MOODLE is not fully pure social software because MOODLE does not provide social networks.*

## 1. Introduction

In the beginning of the third millennium, a new form of learning called e-learning is being introduced. The e-learning decreases the educational costs and it is more effective learning than traditional learning. Globally, it allows the fast dissemination of new techniques and processes, canceling geographic challenges. In addition, time efficiency plays a role, as travel is reduced. Users can conveniently access training materials from home or while on the road via the Internet.

Some technical developments have followed this growth including (i) the increasing importance of broadband, (ii) the decreasing cost of storage, and (iii) the ability of firms to exploit their corporate Intranet. Furthermore, (iv) the emergence of technical standards (such as the Aviation Industry Computer-Based Training Committee and the ADL Initiative) has also facilitated this distinguishable growth. Note that, this sort of distance learning is provided by Information Communication Technology (ICT) and faster computer networks.

Indeed, the rapid use of e-learning systems and technologies has been reported by several studies [2]. In USA, it has been more widely spread than in the rest of the world, and in Europe e-learning has tended to be focused in some countries such as the UK, France and Germany. In a market, Gartner Group Report estimated that e-learning makes up several billion, but the research group expects this to grow sharply.

In Jordan, numerous universities are offering now e-learning sites (portal) for academic and administrative purposes. Jordan Isra University, Petra University, and Hashimate University use e-learning systems such as MOODLE[1] and Blackboard[2]. These portal sites help students and teachers to introduce the contents of courses in easy and effective way [8]. Some activities are offered in these portal sites as follows:

- On-line tests for computer skills, English, and Arabic modules.
- Student authentication to its grades, modules.
- Teacher authentication to its contents such as module description, and student's names, and student's grades.
- Online events and latest news about university campus.
- E-salaries and e-attendance for teachers and employees.
- Distance learning.

However, a little attention has been given to a number of issues that faced the e-learning platforms such as security, usability, flexibility, convenience and efficiency for both in research and in practice.

[1] www.MOODLE.org

[2] www.blackboard.com

For instance, yet, universities over world have not realized the importance of enhancement of security for e-learning systems. These universities brought some ready security tools to secure their systems. Today, academia requires sharing, distributing, merging, changing information, linking applications and other resources within and among universities and other related organizations [6,8].

This paper is organized as follows: Section 1 describes the importance of technology and advantages and disadvantages of using technology in education. Section 2 reviews the common e-learning technologies, advantages, and disadvantages. A discussion is introduced in Section 3. Conclusions and further work are offered in Section 4.

## 2. Importance of Technology

Technology is becoming a necessity in university classrooms. Using a technology gives to lecturers the diversity of their lectures, displaying more information, and enhancing student learning. In addition, the use of different technologies in the classroom can help lecturers to save time and allow for more attention to be paid to the content of course.

There are numbers of advantages for using technology and learning materials in the university classroom [13]:

- More active learning
- Diversified teaching ways
- Better student attention and realization
- Less time for lecturers
- Visual stimulation

However there are four weaknesses for using technology when teaching courses [13]:

- Equipment failures
- The need for backup plans and guidelines
- Anxiety for lecturers
- Time spent for learning new technologies and new skills

Even thought these weakness or disadvantages, many of the problems with using technology and learning materials can be overcome by testing equipment beforehand and learning how to properly use each technology.

Several learning materials are available to lecturers including (Cannon & Newble, 2000): (i) Overhead projectors (ii) Video and data projectors (iii) Blackboard (iv) Internet and (v) Course management programs.

## 3. E-learning Technologies and Systems

A Course Management System (CMS) is a web-based system with a database back-end. A CMS assists lecturers in obtaining resources on the web for students and to facilitate the management of course activities and tasks [7]. Some of common e-learning systems available are WebBoard, WebCT, and Blackboard; from the open source there are: MOODLE, and Sakai [9].

A study conducted by the University of Queensland (UQ) [5] demonstrates that one of the most common successful strategy in teaching large classes is the use of web-based course material (e.g., course website, online resources, discussion boards etc.) and use of mixed media in lectures (e.g., power point, overhead, etc.). Nowadays, use of online course management systems is widespread in education [10].

There are three strengths of web-based course management systems are: accessibility of course resources to students, timely communication between lecturers and trainees and reduce paper usage (paperless systems).

A CMS is different from a face-to-face course. Face-to-face course is a traditional learning, used in classroom and it does not require a Web environment. Whereas, the web-enhanced course is a hybrid (traditional and online) and it can almost be used in local environment. On the other hand, web-based course is always online, can be used in distance learning and all the operations in web-based course require a Web connection [14].

A web course has number of advantages including [14]:

- It is a convenient and inclusive at anytime
- It is dynamic and paperless learning

- It helps to build skills and innovative
- It is comfortable learning
- Web course makes the teaching is easier

One of the main strengths of CMS is a security and privacy. Security and privacy techniques have been implemented in the CMS to do the following tasks [14]:

- Student access controlled to activities and tasks
- Guest access controlled to activities and tasks
- Lecturer's Intellectual Property (IP) protected
- Copyrighted materials secured from hackers and crackers
- Student privacy protected from criminals
- Course content selectively released and updated
- Assignment submissions logged
- Tests and assignments more secure using some levels of security

MOODLE, and Blackboard are three common web-based learning management systems widely used in education, training, and knowledge management. This paper compares them functionally, with a particular focus on the using in the teaching and learning of courses [14].

### 3.1 MOODLE

MOODLE is a free software package designed to help lecturers and students as a tool to provide in creation of quality teaching. The MOODLE is abbreviated to Modular Object Oriented Dynamic Learning Environment built by Martin Douglas at Curtin University, Australia [10].

MOODLE has a number of advantages in education. MOODLE is easy to install, upgrade and use. It can be installed on as many servers as involved without an additional cost. MOODLE does not also require modification on Unix, Linux, Windows, Mac OS and any other systems [12]. It is implemented for educational aspects which some other e-learning platform is lack off.

MOODLE 1.6 [1] supports user name authentication. Each user is given an account and password to access the MOODLE portal site. Once logged in, users have access to the courses they are registered in. Lecturers are registered as users that can edit the course's site, including modifing the activities and marking students. The contents of course and activities almost are in the middle of the page. The types of resources are: text files, (X)HTML files, links to WebPages, images, multimedia files and links to uploaded files; while the activities commonly used are quiz, chat, forum, choice and assignment.

MOODLE [1] has a module to conduct survey on the users and it supports built-in template for the questionnaires, however it does not have facility to generate or insert a new questionnaire. An online survey using different tools was built then uploaded the survey website on the course page in MOODLE. Students participate in the online survey in their free time (any time).

Upon using the features that was described earlier, the advantages obtained and disadvantages (problems) are encountered by our experience point of view. First, the advantages of tutorial registration are:

- There is not need to physically come queuing in front of the coordinator's office,
- The registration takes place at the convenient time,
- Monitoring the number of registrations and avoid double entry.

However, the main disadvantage of tutorial registration is that the excel file contains only the name list without the ID and the engineering program.

Second, the advantages of the communication in MOODLE [1]:

- Avoiding regularly repeating and reminding students during lectures,
- Reduction in number of students enquiring for confirmation of activities,
- Immediate respond to students queries and issues through message,
- Motivating students to work outside of class,
- Saving time spent on writing questions which are usually quite lengthy,
- Allowing for more questions and discussion in class.
- Downloading in 'just-on-demand' basis before class,

### 3.2 Blackboard

The blackboard is considered a hybrid teaching tool [13]. The blackboard can be used by lecturers throughout the lecture to discuss ideas or identify main points. It is suggested that only main points or

ideas be written instead of long drawn out pieces of information. The blackboard can be a useful tool to help students visualizing key aspects of the lesson but may make things hard if lecturers attempt to teach a large group. Blackboard assessment tools include:

- Tests
- Surveys
- Assignments
- Grading can be automatic and/or manual
- Control over quiz/test features and functionality
- Availability, grading, reporting, and others
- Important technical/software considerations
- Alternative forms of assessment

Blackboard has a number of advantages:

- Integrate assessment with teaching materials
- Available on demand
- Randomised question selection
- Automatic grading with immediate feedback
- Reporting and analysis

However, blackboard has a number of disadvantages:

- Not suitable for testing of all skills and activities
- Needs to IT skills
- Time required to design and input questions
- Security
- Plagiarism

A Survey in blackboard is targeted to gather learner feedback. This means the results not associated with respondent. A survey also is managed via Survey Manager, it almost identical interface to Test Manager and it needs to be deployed in same way as a Test. In addition, survey can contain all question types but:

- No point values
- No random choices
- No correct/incorrect answer
- Cannot be graded (marked)
- No feedback permitted

In a Gartner Group's 2002 "Distributed Learning in Higher Education" Survey reports that 38% of users use WebCT, 26% of them us Blackboard, 25% no campus standard and 9% other [14].

Furthermore, Casey Green's Campus Computing Study of American Public Institutions reports the following [14]:

- 44.6% WebCT
- 27.7% Blackboard
- 23.1% No Standard
- 4.6% Other

## 4. Discussion

Blackboard and MOODLE are three popular web-based learning management systems widely used in education. In respects to functionality, Blackboard is better than MOODLE. Blackboard permits greater flexibility in designing course curriculum and study schedules, which is particularly fitting for continuing education courses. With many communication and discussion features, Blackboard facilitates active participation among lecturers and students of education courses, and allows more varieties in designing learning materials and resources such as the use of multimedia. The efficiency assessment and grading functions are also flexible enough to meet the special requirements of a wide spread of continuing education courses.

MOODLE distinguishes from other tools in flexibility and conformability. For example, we have used MOODLE in numerous courses from 2007 in Isra University. In "e-transaction" course, the quizzes in MOODLE were conducted in each individual class on different times set by the lecturer. However, the feedback from students was on the different level of difficulties of questions between lecturers, different format of quiz and also inconsistency in grading and feedback, or results were not

given at the same time. As for the first, and second semester tests, they are set on fixed dates performed in a common venue.

Another point, in Blackboard, lectures often send email to all students, or to those in a subset workgroup. Whereas in MOODLE; lectures replaces emails with using the Forum instead. When lecturers post to the class Forum, that posting is emailed to the class participants, unless they have opted out (they can also receive daily digests, all set in their profile). Since the posting remains visible in the forum, those not receiving emails, can check for unread postings. Further, the posting remains visible and may facilitate further discussions.

MOODLE also has more conformability and convenience when teaching large class. The following has been identified as the major challenges in managing large classes [5]:

- Distribution/ organization of information.
- Communication.
- Time and place for discussion or presentation.
- Feedback opportunities.
- Group work.

However, we still have some open challenges relating to teaching and assessing students in large classes. We still question that how can Web 2.0 or Web 3.0 satisfy and solve the open issues in large classes? Some of these open issues are listed [7, 11]:

inability to get to know students,

- inability to reduce students feeling of anonymity,
- how to create interest and interaction in class,
- managing marking loads and maintaining consistency,
- dealing with email,
- scheduling office hours for consultation,
- assigning homework or tutorial materials,
- recording grades, and
- how to effectively communicate the subject material.

Another challenge is a security. Built-in security in e-learning tools is not sufficient to protect students and lecturers resources. But because of MOODLE is open so the developers can add extra level of security and enhance the protection method in MOODLE. We have improved the security by add codes that helps us to avoid and prevent some types of web attacks.

Yet, universities over world have not realized the importance of security of e-learning systems. These universities brought some ready security tools to secure their systems.

However, security principles (such as data integrity) of e-learning system could be lost. For example, an adversary (criminal) can penetrate the web system in many forms [3-4]. An insider adversary, who gains physical access to a web server, is able to destroy any type of static content in the root of a web server. It is not only physical access to a server that can corrupt e-learning systems. Malicious web manipulation software can penetrate a server machine and once located on the server such malicious software can monitor, intercept, and tamper online transactions in a trusted organization. The result typically allows the adversary full root access to server data and web server application. Once such access has been established, the integrity of any data or software on a server is in question.

One of the main trends is e-learning 3.0 that use Web 3.0 tools for social learning. New services on the Internet can be swiftly integrated into existing applications such as integrating Weki with Web 3.0. The primary risk comes from the fact that students and lecturers are not entirely realized that their universities do not control these web services. The servers are located in a variety of countries, therefore privacy laws and principles also differ from one country to another.

## 5. Conclusions and further work

The three main e-learning tools such as MOODLE, and Blackboard have been reviewed. We also comment on the most important aims of each tool and analyze the advantages and disadvantages. While both Blackboard and MOODLE are learning management systems with many in intersections, there are some key differences that we have noted in the Section 3 and Section 4. Our teaching experiences indicated that the MOODLE is effective in the e-learning development. However, MOODLE is not fully pure social software and thus we will understand fully social tools such as Web 3.0 to use it in the university classroom.

One of the main challenges that should be taken in account, the current e-learning systems faces some security issues because a security is not integrated into the e-learning development process.

In the next part of this research, we will arrange survey about the importance of e-learning systems in undergraduate education. We will evaluate the results in accordance to a number of criteria including security, performance, usability and flexibility.

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