A PROPOSED MODEL OF LEARNING MANAGEMENT SYSTEM THAT SUPPORT THE MAJOR CHARACTERISTICS OF E-LEARNING

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Abstract- Increasing numbers of students who attend various educational institutions, led to high volume of work required in these institutions from both the academic and administrative employees, and because the learning management systems and e-learning are the future in the academic area, they are adopted by many of the universities around the world. This research has many objectives, the first one is introducing the learning management systems and their benefits in e-learning, the second objective is comparing between the two most common Learning management systems which are Moodle and Black Board, and finally the researchers propose a model of learning management system to support major characteristics of e-learning. The proposed model consists of two variables the first one which is the independent variables that include application and integration, communication, assessment, content, and cost. The second variable is the dependent variable which is the success of learning management systems. The researchers will compose a suggested number of questions to measure these variables according the set hypotheses.

Index Terms- e-learning, Learning Management System, Moodle, Blackboard.

I. INTRODUCTION

In the past education was only in a classroom were the students with a teacher who guided the education process using printed books and board, there were no other alternatives that support education, then the information technology evolution happened and it entirely changed the learning environment and introduced e-learning [10], [11].

E-learning is a technological structure that empowers education anywhere at any time and consolidates every educational activity done by individual or groups even online or offline [5].

E-learning also known as the online delivery of information for purposes of education and training [1].

Today e-learning is applied using the internet such as websites that contain variety of educational content, in spite of the fact that in the past it was delivered through basic information technology ways like compact disks that contains different types of materials such as PDF files, document files, images, videos, audio, and flash [1].

E-learning systems have many benefits such as [1], [7]:

- Better for environment: less papers and printing which implies less tree cutting and using of ink.
- Reduce time: minimize time spent on traveling, reaching students, marking exams, doing experiments, manipulating students’ information, and updating content and materials.
- Wide spread: everyone can access course materials without need to be in the same country or region.

Although there are many benefits of e-learning but it has a few limitation such as [7]:

- Isolation: most part of electronic learning done by the student, and there is less interaction between student and teachers, lack of face to face interaction.
- Don’t fit all types of learners: because it needs a good time management skills, and a well-trained student in using technology.
- Material designing issue: course materials need to be redesigned to fit online use
- High cost on short term: initiation of infrastructure and systems need high cost.

II. LEARNING MANAGEMENT SYSTEMS (LMS)

Learning Management System (LMS) is a software that is used in educational institutions to support their learning process and it offers communication tools, different assessments, and study materials [2]. LMS also known as virtual learning environments (VLE), course management systems (CMS), and learning support systems (LSS) [7].

We can conclude from the learning management systems definition that a learning management system
is intended to convey instructor led courses which includes two types of communication channels between students and instructors and also between students themselves.

As shown in figure 1 any LMS must include the major components which are the course management, student management, feedback management, material management, online exams, and assignment assessment [6], [12].

![Figure 1: LMS management system components](image)

Based on the main parts of Learning Management System, it has many characteristics, we summarize the major characteristics in table 1 [6], [7], [13], [14], [16], [17].

<table>
<thead>
<tr>
<th>Part of LMS</th>
<th>Description</th>
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| Content     | • provides course outlines  
• offers lecture notes  
• supports interactive resources (video files, self-test, presentations)  
• presents links to scholarly information  
• offers animated case studies and experiments  
• information are consistent  
• dynamic and refreshed content  
• presents warnings for academic behavior and absence  
• resources can be accessed anytime/anywhere |
| Communication | • multiple announcements shown throughout the semester  
• offers discussion groups for |

<table>
<thead>
<tr>
<th>students</th>
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| • direct chat between students and instructors granted  
• should provide email service  
• live events and video conferences can be done |

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<tr>
<th>Assessment</th>
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| • periodic quizzes / exams can be conducted  
• grades are shown for students during the semester  
• auto correction for assessments / exams is supported  
• results and correction scheme are presented to student after exam  
• assessment questions are generated according to student behavior throughout the exam time and the semester (behavioral change)  
• surveys and feedback are offered by the e-learning system  
• tools to evaluate individual and groups work are supported  
• Absence can be taken using system |

<table>
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<th>Integration and application</th>
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| • run cross platforms with acceptable requirements  
• affords user friendly interface  
• Multilanguage interface are available in e-learning system  
• system response time is acceptable  
• provides training or help documents for users |

The most two common used learning management systems in the world are the Moodle and blackboard. Moodle is an open source system introduced in 2001 as a PhD research project, the first release was launched in 2002 and by 2007 there were 69 installation of it with more than 20,000 users nowadays it has near 65,000 registered websites with more than 81,293,907 users from 224 Countries [8].

Moodle is one of the best user friendly LMS that is easy to use with strong documentation and many features, the best gained of open source system is the possibility of high on demand customization. Apache, PHP, and MySQL is the technology that is used in Moodle [3].

Blackboard is a closed down system owned by blackboard incorporation located in Washington – USA and it provides course management, communication between parties and many other features. Blackboard is known with its performance...
and stable powerful infrastructure, on the other hand, it requires a yearly subscription for each user which means a high cost for large institutions so it only serves around 4 million users, and because it is hosted on blackboard servers it is hard to customize or integrate with other systems [3], [9], [15].

After many comparative studies and researches it found that Moodle is better than Blackboard in light of [3, 4, 5]: Cost: Moodle is less expensive than Blackboard in the long term because the cost is paid once in the initiation stage and it is totally free after that. Interoperability: interactions with external APIs and old systems are better in Moodle than Blackboard because everything is stored on your own server so you can do whatever you want. Customization: Institutions prefer open source and self-hosted systems because customization is easier than closed system hosted on out not owned servers that requires a change request that could be accepted or rejected by the service provider.

III. PROBLEM STATEMENT

This research will focus on the main problems in LMS that face the Jordanian universities, some of these problems are:

- Customization of the system to fit students, regulations of ministry of higher education regulations and syllabus adopted by institutions in Jordan, we should consider that not all the developers at universities have the capability to modify open source systems to fit their environment, the system itself is too complicated to be customized or doesn’t allow customization.
- Integration with the other systems specially the old ones that were applied before adapting LMS like financial system or student management system, some LMS don’t support old systems and technologies, or have their infrastructure far away from campus and uploaded on the service providing company servers so it is impossible to connect with local systems.
- Cost should be minimized due to the financially issues that affect Jordan in general so it is a problem that faces governmental and private universities, on the other hand less cost software’s do not offer all the needed features.

IV. RESEARCH OBJECTIVES

The aim of this research is to propose a model of better e-learning system that is suitable, fits needs of higher education institutions in Jordan, and supports major characteristics of e-learning systems efficiently and effectively. It should be better in:

- Customization: support Multilanguage graphical user interface, many types of content, easy to use, fit students’ needs, support regulations of ministry of higher education, hold up syllabus adopted by institutions in Jordan, and have different types of communication and assessments.
- Integration: it should run across platforms, and can be merged and integrated with other systems.
- Cost: should be less or near than other solutions, because development cost is paid once so no other costs rather than operation costs will be paid, when another institution uses this system it would have less customization cost because it was already customized by other universities from the same country and contain the same or close features.

V. RESEARCH HYPOTHESES

The researchers have set the following hypotheses in order to test the proposed model:

H01: content of LMS does not have direct impact on the success of LMS.
H02: communication methods have no direct impact on success of LMS.
H03: there is no significant relationship between integration and success of LMS.
H04: Multiple assessment types have no direct impact on success of LMS.
H05: cost have no correlation with success of LMS.
H06: content, communication, integration, assessment, and cost have no direct impact on success of LMS.

VI. PROPOSED MODEL

According to the characteristics of LMS shown in table 1, the proposed model composed into two variables, the first one is the independent variables which focus on five main criteria which are application and integration, communication, assessment, content, and cost. The second variable is the dependent variable which is the success of LMS as clarified in figure 2.

CONCLUSION

This research has introduced the two main concepts that are used in education which are e-learning concept
and learning management system, then describe the benefits of these two concepts, after that the major characteristics of learning management system has been explained. The researchers compare between Moodle and Black Board which are the most common learning management systems in the world. Finally the researchers propose a model for learning management system based the major characteristics of learning management system in order to support e-learning. The proposed model consists of five independent variables and one dependent variable which is success of LMS.

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