# Comparison of Virtual Learning Environment System (Blackboard) and Open Source Learning Management System (Moodle)

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**ABSTRACT**

Nowadays, the E-Learning system is an emerging solution for every reputed educational institution, especially universities which are run their distance learning courses by implementing E-learning services. Too many applications and tools are already available abundantly today to promote E-learning in multiple ways. This paper presents the utilization of online learning of learning management system (LMS) including the architectures, uses and limitations in information management. The main point in this article is; comparing the basic features of functionality of Blackboard and another tool of LMS which is Moodle. Also, this article discusses the advantages and disadvantages of the basic features of selected tools for better academic information management.

**Keywords:** Learning Management System (LMS), Virtual Learning Environment (VLE), Blackboard, Moodle

الخلاصة

يُعد نظام التعليم الإلكتروني –هذه الأيام–  حلاً ناشئًا لكل مؤسسات التعليم الحديثة؛ خاصة تلك التي  تسعى إلى تعليم منتسبيها عن بعد كالمعاهد والجامعات؛ إذ توفر هذه الخدمات عدد من التطبيقات والأدوات المهمة التي تسهم في تعزيز مهارة التعلم الإلكتروني بطرق متعددة؛ لذا اهتمت هذه الورقة ببيان كيفية الاستفادة من نظام إدارة التعليم عبر الإنترنت (LMS) والهيكلية التي يقوم عليها، وطرق استخدامه، وقد ركزت هذه الورقة على المحدودية في إدارة المعلومات، وقارنت بين الخصائص الأساسية لوظائف Blackboard مع خصائص أداة أخرى من LMS وهي Moodle. كما تطرقت الباحثة

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في هذه الورقة إلى نقاش المزايا والعيوب الأساسية للأدوات المختارة لتحسين إدارة المعلومات الأكاديمية.

**الكلمات المفتاحية:** نظام إدارة التعلم (LMS) ، بيئة التعلم الافتراضية (VLE)، Blackboard، Moodle

## 1. Introduction

Information technology grows in the present world of education rapidly. These changes in technologies and the way of using computers to provide services come to assist the improvement of E-learning (Aldheleai et al., 2017).

Environment education becomes powerful and digital such as Learning Management Systems have appeared; training material, electronic tools of assessment and evaluation. Learning Management Systems (LMSs) offer easiness of use, a modern user interface and can be a lifelong learning. The LMS does not need any installation and can be accessed by logging into a service provider's site as they are hosted on the internet (Gurunath, & Kumar, 2015).

The web based education systems are LMS focus on management of teaching contents and on administrative support. The basic definition of learning management system is a software application that automates the administration, self-guided services, sharing of learning contents and enable knowledge reuse (Subramanian et al.,2014).

In the context of LMS; "Blackboard is a multimedia curriculum-driven learning system that provides instructors with control and flexibility" (Carnevale, 2003). A virtual learning environment such as Blackboard is web-based learning management system designed for learners to participate in online classes (Aldiab et al , 2019).

Moodle is "free package designed using known pedagogical principles to help the educators to create effective online learning communities" (Subramanian et al., 2014). The entire infrastructure that necessary to build a learning management system can be provided by opened source software such as Moodle (McMahon, 2002).

The purpose of this paper to compare different learning management systems (LMS), Moodle and Blackboard .It also describes the

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architectures of both Blackboard and Moodle. After that, the discussion of comparison and the conclusion is given in the final section.

## 2. Related works

Kc (2017) have presented the result of examination of Moodle features at Kajaani University of applied science. Moodle offers customizable adaptation to the user who can customize his own course, perceive its usefulness and ease of use that are very important for delivering course content and creating quizzes and workshops. Alenezi, &Shahi (2015) proposed virtual platform Blackboard to create the virtual classes to attract the students. Blackboard as has been mentioned, gives a very easy method to assist both faculty and students in all details of using. Priyavahani Subramanian (Subramanian et al., 2014) has made comparative study between Blackboard and Moodle , based on communication tool, productivity and student involvement tools. The virtual learning environments Moodle and Bb have different features but Moodle has been mentioned as the suitable e learning system, and it still depends on individual preference. Al-Drees et al (2015) introduced study that was conducted at the college of medicine, King Saud University. The survey was consisted of utilization of Bb and difficulties while using Bb. The need of training students and staff was indicated as findings of this study, during launching any new learning management systems in educational institute. Aldiab et al (2019) have showed the percentage of using different commercial LMSs applications in universities where Saudi Arabia was taken as a case study, also many features and utilization of LMS have reviewed .This study carried out that Blackboard is the most known application and gained nearly 90% of using at universities in Saudi whereas the present of using Moodle did not exceed 10%. Ablahed (2017) explored an ELCSM system (E-Learning for Computer Science Department) which is employed the Moodle as an E-learning tool to present different kind of curriculums in Computer Science Departments. The result was ELCSM system is ideal to support an educational process and encourage the experiment of students in general.

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## 3. Blackboard

The Blackboard learning system is web-based learning management system created for learners and educator to participate in online delivered classes. More over the Blackboard is a flexible and complete learning platform that transmitted an entire course management system. Institutions in information industry focus on; Generate, Gather and Group information then give information. Educators; generate the appropriate content and suitable resources that are applicable to the content for students. After that arranges the material into modules and gives the information to the learners (Subramanian et al., 2014). The Blackboard is used not only as warehouse of information, and also used as tool for communication through discussion boards, emails etc. Educators and learners need to be efficient to utilise this educational technology and use Blackboard in capable way (Moeller& Reitzes, 2011). Utilisation of Blackboard learning system by faculty's members should achieve seven online learning principles that contribute to effective learning results (Graham, 2001):

1. Educators should supply clear guidelines for interaction with learners.
2. The cooperation between learners could be supported by Well-designed discussion board.
3. Course projects should be presented by students to encourage active learning.
4. Feedback of information and confession feedback need to be provided by educators.
5. Deadlines needs to be existed on online courses.
6. Uplifted expectations, challenging activities, sample scenarios and the ability of praising for quality work are set deliverables, which attributes to effective learning.
7. Project topics combines varies views into online courses are allowed to be chosen by students.

Environment of Blackboard proposes many of online educational advantages for learners. The online feedback to queries of student over emails or discussion board, it encourages the student to be more interactive (Alzahrani& Aljraiwi, 2017). This learning environment provides the ability for students to

write while discussion, revise and retrieve course material and discussions notes, add on or delete any part of discussion, cut and paste materials from different resources, and edit teaching materials. In addition, study location is not constrained (Belanger, 2004).

The student's satisfaction of usability of Blackboard is strongly linked with the flexibility in use. Students have highly required accessing Blackboard anytime, anywhere and various learning tools for their different learning styles (Downes, 2005).

Writing Tex notation finds as only problem with Blackboard software platform in study at the Park University, USA (Machado & Tao, 2007). This problem was not solved completely despite of different alternatives were offered by Blackboard collaborate. A study referred that; the concept of remote laboratories is not easy to be included in each LMSs, as practical courses demands different laboratories and materials (Alkhaldi et al 2016). Also mentioned LMSs such as Blackboard can integrate with virtual laboratories in some cases. The pros and cons of Blackboard in education have been showed. It's all based on users' use, what they need and how IT team arrange the LMS for more easy use interface (Logan & Neumann, 2010).The security issue and the cost are two of the main limitations within an LMS have been introduced. The Blackboard tools can be expensive. The cost has become an issue as educational institutes have to pay license and maintain Blackboard software (Moodle, 2017).

## 3.1Blackboard architecture overview:

Figure (1) showed the Blackboard application contains three main components (Subramanian et al., 2014):

Knowledge sources (KSs) are software expertise modules.

The Blackboard can be called a dynamic library off contributions to the problem that have been shared by knowledge sources.

Control shell is responsible about the flow of problem solving tasks in the system. It provides mechanism that is needed by KSs to control their use effectively.
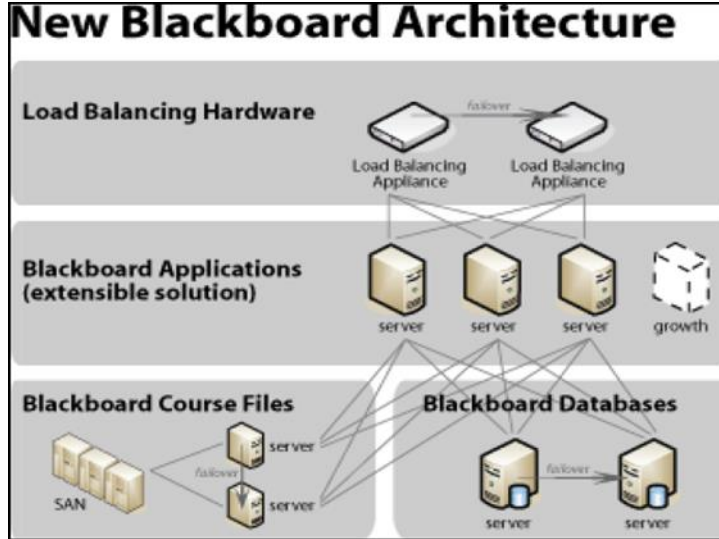
FIGURE 1: Blackboard Architecture

## 4. Moodle

Moodle is one of commercial LMS that is known in 2001 by Martin Dougiams to use as supporting tool in some education institutions with classrooms in the real world.

Modular Object Oriented Dynamic Learning Environment (Moodle) used firstly at Curtin university in Australia .The earlier version was in 2001, where as in 2018 was the newest one .The usage of Moodle does not require fees to be; downloaded, used at first time or renewed in next times .As a result of being Moodle under an international license (GNU); that guarantee all copyrights of primary license moved to any new version of Moodle software (Cavus& Zabadi, 2014) (Dascalu et al., 2021).

Educators and learners achieve many benefits if they implement Moodle as a facility to communicate. One of these benefits is; various languages can be customized .Further, themes of Moodle can be changed for all or single courses. Moreover, diverse database systems are supported. Moodle does not involve modifications if it installed on different operating systems. Tex notation, a mathematical formula can be written (Gurunath, & Kumar, 2015).Over and above that, according to Cavus& Zabadi , (2014), discussion forum on Moodle are active and, it has different forms.

Also, discussion can be synchronized; because of Real time chat attribute is supported on Moodle Accessing information is easy. On the other hand , some of limitations of Moodle are noticed ,major users of Moodle  well educated such as experts in IT, researchers ,and teachers, that means normal user have difficulties to use it .In addition to that, release an updating is infrequently  ,because of  it is  open source .

## 4.1  Moodle Architecture overview

Moodle has three levels of architecture. Storing files represent the last layer.A data base is in the middle, whereas the first layer is a PHP server.All servers in those levels have to work side by side in order to have a right implementation for Moodle application (Subramanian et al., 2014).
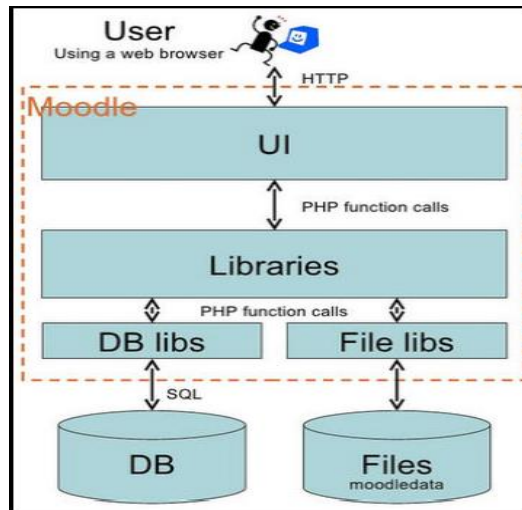


FIGURE 2: Moodle Architecture

## 5.  Comparing  of basic features of Blackboard vs. Moodle

The basic functionalities compared in 3 phases as following list. This comparison is between Blackboard (release 9.1) and Moodle 2.0 (Leeder& Lonn, 2014).

## 5.1  Communications Tools:

The various communication tools in LMSs can support sharing of information and encourage interactions between users.LMS and its

collaboration tools and communication tools allow them to communicate with learners and educators through discussion forums. In discussion forums; Blackboard and Moodle learners can receive posts by emails and they have the ability to enable or disable receiving them. A spell checker is also available for learners and educators' replies. Learners using Moodle or Blackboard can submit their work of assignments using drop Boxes. IT team of Blackboard can specify disk space for each user to be able to share their personal folders. Moodle users can receive email notification of any course but in Blackboard this feature is not available. Notifications dashboard in Blackboard shows new information for contents that added for all courses that learner is enrolled. In Moodle; the most contents linked with time and the user who recently updated, also provides details such as links for more information about last events.

## 5.2   Productivity Tools:

Productivity tools assist educators to create interactive courses that help students to stay up to date in their studies. Learners who use Blackboard; have personal homepage that contain all enrolled courses, posting events, and can view courses' grades. Educators can post events in course calendars and announcements. In term of progress review and calendars both Bb and Moodle, educators can subscribe to RSS feeds to be alerted of changes to contents. Learners can search all discussion, chat and recording of virtual classroom in Moodle but discussion thread can be searched by learners in Bb.. Module page in Blackboard is similar to notifications dashboard which contain information about new content and scheduled dates for courses. in Moodle; new activity and next events can be both appeared left hand side of module page

## 5.3  Student Involvement Tools

Student involvement tools can be used by learners in communication process, assessment. Groups can be created first in Blackboard then edited later to add learners, also learner can create and edit their own groups. Creating groups in Moodle, use the same way in Blackboard; members can be added by selection from list on same page. Learners groups can be created by learners and self-select group is available. Community networking in Blackboard; learners can create study groups and online clubs. The discussion

board, template and other features are excited for each created group. Moodle 2.0 allows differentinstallations to network. Any user is allowed to customize their Moodle site into a Moodle community hub with safe login; that all controlled by site administrators. Courses menu is updated automatically in Moodle, and "+" icon can be clicked to access the list of courses in Blackboard. Individual submission of assignment is available in Blackboard groups and many attempts for submission. Moodle can authorize for multiple file uploading and there is "send for submission" button to be pressed for complete assignment submission. Smart view is available in Blackboard for learners to view their grads and showing who havea special grade. Moodle 2.0 provides personal grade letters that can be edited in spreadsheet view.

## 6. Discussion

This reviewresult that, comparing any LMS packages to enhance the  functionality of education process to be flexible and efficient that depend on important  features of LMSs .These attributes labeled as outcome tools ,and tools to increase student`s interaction. This paper introduces comparison of Blackboard and Moodle hence they are almost popular LMSs. The two mentioned LMSs have the core features which must be identical in any system that supposed to support distance learning. Some of those features which are known as outcome or Productivity Tools, such as: calendar, language adjustment and module page .Both systems have features that support group work and participation between students, i.e. chat quick mail and discussion forums. Sharing files can be done in   Moodle and Blackboard and a lot of attributes are common between them. On the contrary side, characteristics for virtual labs are not available on both of them. Blackboard contains a specific tool for syllables and lesson plan whereas Moodle does not include that. Blackboard also includes a direct tool of safe assignment which is designed for prevention of plagiarism. The price is the factor that most distinguishes the LMSs. There is no difference in tools which are provided by Blackboard and Moodle, although Black board is offered for payment and Moodle free charge.

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## 7. Conclusion and future work

AT the present time ,using e-learning tools around the world has become in growth.As a result of that,  companies that develop different  LMS package are working hardly ;to improve their services in order to  give progressive to an educational process generally .Choosing a LMS tool to be deployed on an institute is not easy decision  ;that decision depend on  many criteria  from user`s perspective  such that :the knowledge of an technology  and learn how to interact with it ,should be at reasonable level .And educational integrity . Also, availability of technical support for new LMS .This paper has discussed the comparison of a Moodle and Blackboard, from different aspects .It concluded that, both of systems have advantages and limitations, but select one of them to be deployed and used ,depending on preference and requirements of an institution individually .Also usage of users effect on selection .The future work will concentrate on LMS based on cloud technology.

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