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## **Moodle – An Effective Learning Management System for 21<sup>st</sup> Century Learners**

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### **Abstract**

Technology is been used in almost all aspects, including education. Anytime, anywhere learning is the new jargon in today's digital world. So there is a need to change teaching techniques to the technological changes. The recent trend of higher educational institute throughout the world is to use E-learning as it delivers more training to students at its fast, convenient and consistent advantage.

The use of technology and the Internet has made education so convenient to undergo significant changes thereby bringing new methods of teaching and learning (Lopes. A.P., 2014), Students are part of the new digital age; their lives revolve around computers, smart phones, games and online messaging. Recently one of the most widely used methods of teaching that is used to promote knowledge is being focused on online teaching-learning. The use of Information and Communication Technology (ICT) in Education and particularly, the integration of Learning Management Systems (LMS) play a vital role in today's digital era. The Learning Management Systems (LMS) are technological learning environments that support online course delivery. They offer comprehensive synchronous and asynchronous services that support collaborative learning (Filippidi et al., 2010). The Present paper is briefs about e-Learning, LMS, their features and role in the present teaching – learning process.

**Keywords:** LMS, E-Learning, ICT

### **Introduction**

Computers and Internet are used as tools to enhance the teaching and learning process. It is said that the multimedia capabilities and the hypertext navigational tools of the World Wide Web not only provide access to multiple perspectives on a certain subject matter but also provide some degree of control to learners as they try to make sense of the content (Gunawardena, 1999).

Traditional teaching methods, with teachers in front of a blackboard giving long hours of lectures do not “work” with today's students and certainly will not work with the students of tomorrow. By using ICT (Information and

Communication Technologies) the teacher's role is being transformed from a traditional profession to an intermediate supporter towards the facilitation of the students to conquer knowledge (Kalogiannakis 2010). King (1993) advocates the importance of the student to take a more active role rather than being passively taught.

Active learning is defined as the process of engaging students in activities in such a way that they are supported to reflect upon ideas and how these ideas are being executed (Michael 2006). We live in an ICT dominant era and the opportunity students are having to learn, develop skills and critical thinking through ICT is clearly demonstrated through a series of policy initiatives over the last decade (Littleton & Whitelock 2005; Muttona et al. 2006). The integration of ICT as an educational tool should be considered as an approach of updating the learning and teaching procedure.

Nowadays, the computer is a significant part of the learner's daily life. It is, by now, inevitable that methods of teaching and learning should include E-learning components that are based on the computer environment and include proper preparation for the 21st century which requires a "new pedagogy" (Martin and Madigan, 2006).

The use of modern technology in teaching languages has been dramatically increasing worldwide over the past decade. With the creation of the World Wide Web, it has become possible and feasible for teachers to make effective use of instructional materials. One benefit of using Internet resources is that teachers can easily retrieve the most recent and pertinent information for their students (Moore, Morales, and Carel, 1998).

Online communication increases students' thinking ability, and they feel less stressed. Online learning can enable learners to interact with other speakers of the target language. Warschauer (1997) claims that online communication is a possible cognitive amplifier that encourages both reflection and interaction. Many institutions create the need for developing effective methods in teaching pedagogy. Coming up with one solution to students of today's E-Learning. E-learning is being increasingly looked to bridge the resource gap, many institutions are experiencing. Support of E-learning can be transformed to teaching and learning and to reach and motivate learners with special needs. The aspect of E-learning is especially important for students living in remote areas, in non-urban contexts, who may lack authentic materials and contact with the target language and culture. Among technology facilitation, Moodle is one tool that is widely used to transfer teaching and learning. Moodle is a license free open-source software platform and involves E-learning.

Learning Management system gives an in-sight of the various facilities that can be used in Moodle like blogs, chat, forum, uploading of assignment, viewing or downloading e-content, news and assessment of students through online quiz etc.

The training and education are learning environments in which there is need to use modern approaches to explore the various aspects of topics. There are number of software and hardware tools available for learning. Many of learning systems are closed and some are open. Virtual learning environments (VLEs) such as Moodle are now widely used in universities and other organizations. Moodle is an open source Learning Management System (LMS).

Moodle is a software package for producing internet-based courses and websites. It is a Learning Management System (LMS) that allows better cooperation among learners, tutors and students.

### **Open Source Applications:**

The free online class platforms that must be hosted on your own server are "open source applications" (Aditya. N., 2005). This means that the software is available free for limited use under the terms of the GNU General Public License (GPL). This basically means that the user can copy it, distribute it, even charge for it, but cannot get patents on it. Also, the source code must always remain open and available for viewing by anyone looking at the site so that it does not become proprietary.

Many commercial or open-source systems for organizing courses are available, offering access to course materials, communication support, and receiving and grading student submissions (Ro et al., 2010).

### **E-learning:**

E-learning is an emerging field as a promising instructional medium as well as a ripe arena in which to conduct research on its impact on teaching and learning activities. The fundamental nature of e-learning as an instructional medium differs substantially from face-to-face delivery, thereby requiring more new features for course development, online assessment and interaction. The implementation of effective e-learning through Moodle and how the various facilities of Moodle are used by tutors to provide interactive and stimulating learning experiences in providing higher education in various colleges of technology.

E-learning is a process of education in electronic form through Internet network or the Intranet with the use of management system for education. Broadly there are two approaches generally seen in e-Learning.

The Web Based Training (WBT) or eLearning is emerging to replace traditional training. “E-Learning”, is rapidly becoming the preferred route to building and maintaining advanced performance capabilities via improved efficiencies and effectiveness. For many organizations, especially those in the developing countries, acquiring a commercial LMS could be very costly in order to host the contents. The purpose of this paper is to introduce Open Source software and how it could be used in implementing a free LMS system and to introduce how the College of Internet Distance Education at Assumption University has achieved it. (Carboera. et al., 2005)

### **Teaching in E-Learning Environment:**

Teaching in E-Learning Environment can contribute to the ability to teach, the ability to learn and most important to bridge between two main components in the classroom, the teacher and the learner. E-learning provides different environments for learners with dynamic, interactive, nonlinear access to a wide range of information (text, graphics, animation) (Jonassen, 1996; Jacobson & Archodidou, 2000) as well as to self-directed learning in online communication (e-mail and forums).

E-learning is based on concepts such as independent learning, active learning, self-directed learning, problem-based education, simulations, and work-based learning (Martens, 2004). Most of these models are based on constructivism in which, according to Reiser (2001), learners become responsible for regulating their own learning process. Self-regulated learners are motivated, independent, and meta-cognitively active learners in their own learning (Duffy et al. 1993; Wolters 1998; Dalgarno 1998; Pierce & Jones 1998; Bastiaens & Martens 2000; Herrington & Oliver 2000).

**Approaches of E-Learning:** There are two approaches of E – Learning namely Asynchronous e-learning and Synchronous e-learning.

### **Asynchronous E-Learning:**

Asynchronous E-learning commonly facilitated by media such as e-mail and discussion boards supports work relations among learners and with tutors, even when participants cannot be online at the same time. It is a key component of flexible e-learning. In fact, many people take online courses because of their asynchronous nature, combining education with work, family and other commitments. Asynchronous e-learning makes it possible for learners to log on to an e-learning environment at any time and download documents or send messages to tutors or peers. Students may spend more time refining their contributions, which are generally considered more thoughtful compared to synchronous communication.

**Synchronous E-Learning:**

Synchronous E-learning, commonly supported by media such as video conferencing and chat, has the potential to support learners in the development of learning communities. Learners and tutors experience synchronous e-learning as more social and avoid frustration by asking and answering questions in real time. Synchronous sessions help learners feel like participants rather than isolates.

**Process of E-Learning:**

The process of e-Learning can be represented into four stages

- a) Skill Analysis
  - b) Material Development
  - c) Learning
  - d) Evaluation
- 
- a) **Skill analysis-** The learning manager analyses the learner's present skills and skills that are set as a learning goal, and obtains the necessary material information. The manager then searches for the related material.
  - b) **Material development-** The developer creates the material outline structure and exercise questions. The material structure is linked with explanatory pages.
  - c) **Learning-** The learner engages in learning that is suited to the need, that is, individual learning for knowledge acquisition, or collaborative learning for workshop-type learning.
  - d) **Evaluation-** The learner carries out exercises and takes examinations using questions designed according to the learning goal. The learning manager makes the evaluation of each learner, using results of exercises and examinations.

**Review of Literature:**

Morrison (2003) defined E-learning as the use of the Internet to teach and learn. It includes interaction between teacher-student and student-student or teacher-teacher, as well as facilitating students' submission of assignments. It delivers and enriches learning content. Additionally, students can use the Internet as a research and publishing tool.

Felix (2003) agreed that web-based instruction is delivered over the Internet or over a school's intranet. The scholar also defined E-learning as a process of learning through computers over the Internet which meet three criteria: a geographical distance separates communication between teachers and students, the learning communication is two-way and interactive, and different technology is used to facilitate students learning process.

Bach and Smith (2007) related that E-learning covers several types of applications and processes, including computer-based learning, web-based learning, virtual classroom and collaborations. The educators explained E-learning as a subset of distance learning, online learning as a subset of E-learning and computer-based learning as a subset of online learning. It is also mentioned that E-learning not only provides value through planned learning but also recognizes the value of unplanned learning and the self-directness of the learner to increase learning experiences to improve learning achievement.

E-learning, also known as online learning or web-based instructions, provides a way to connect the gap between the student's changing generations and prepare the need for higher education in the global education (Harris, 1996).

The tools available for creating E-learning started from basic computer programs such as a word processor and presentation graphics software to complex computer programs for creating animations, movies and 3-D graphical simulations. Learning Management Systems (LMS) are perhaps the major tools available to E-learning instructions. Moodle is a free online Learning Management System (LMS) which is good for language teaching (Garrote, 2007)

### **MOODLE for E-Learning:**

Moodle is “open source”, allowing developers to tailor the system to individual needs. It also communicates extremely well with many web -based resources (Facebook, YouTube, Wikipedia, J Clik, Hot Potatoes etc.), allowing developers creativity and versatility. The design of Moodle is based on socio-constructivist pedagogy. This means its goal is to provide a set of tools that support an inquiry- and discovery-based approach to online learning. Furthermore, it purports to create an environment that allows for collaborative interaction among students as a standalone, or in addition to, conventional classroom instruction (CP).

Moodle (Modular Object-Oriented Dynamic Learning Environment) is basically an Open Source e-learning platform. Moodle is a Course Management System (CMS) - a software package designed to help educators to create quality online courses. Such e-learning systems are sometimes also called Learning Management Systems (LMS) or Virtual Learning Environments (VLE) (Kameron, Saskia E., 2006). Moodle presents an excellent platform for resources and communication tools. It was created by Martin Dougiamas, a computer scientist and educator who deeply believes that a CMS should be created by an educator and not by an engineer.

The word Moodle is an acronym for Modular Object-Oriented Dynamic Learning Environment. Moodle is available free of charge under the terms of the GNU General Public License (GPL) and has no licensing cost attached (Brandle, 2005). Moodle is a software package designed to assist educators in creating online courses with opportunities for dynamic interaction. Moodle is an open source software (OSS). Open source means “software that is freely available for people to both use and modify” (Brabzburg, 2005) by making the code available.

Moodle is the name of a program that allows the classroom to extend onto the web. This program allows a common place for students to go for many classroom resources. Using Moodle, teachers can post news items, assign and collect assignments, post electronic journals and resources, and more (Marcais, 2002). Su (2006) explained that Moodle is a free online Course Management System (CMS) which is particularly good for language teaching. It contains many useful and friendly tools to create and operate the courses.

Moodle is a template-based system to which allows us for easy navigation. The whole page is presented in a "flat view" format. It is laid out in small blocks and organized around sections following a topic or weekly outline. Each section has its own tools such as lessons, quizzes, assignments, and forums. All blocks on a page can be individually arranged, and the elements within each section can be easily moved around or be hidden (Williams and Brayon., 2005).

### **Moodle a Great tool for Tutors:**

Moodle is a great tool for tutors because it is a platform to create and save teaching material easily and a collaborative online platform for teachers and students to learn together. Besides creating courses, it is also very useful to join the online communities to keep yourself updated with the world and to know a circle of scholars that will truly encircle the globe.

Moodle allows the integration of a wide range of resources, from chats and forums to online booklets, a variety of questions, collections of problems and exercises, lecture notes; including any kind of text-based or html formatted documents, multimedia resources such as graphics, video or audio (ex. MP3 files), PowerPoint, or Flash-based applications and Java applets (Goodwin-Jones, 2003).

Teachers can provide students with a large amount of resources that they cannot usually show in the classroom due to time constraints. Lesson tasks within Moodle can be linked to any resources that are uploaded to one's server or that are available on the Internet. The students' exploration of any of the content-based resources can be easily assessed by using any of the Moodle based evaluation and feedback tools. Moodle is quite powerful in content creation due to its built-in HTML editor. The degree of expertise required is essentially the same as for any word processor. More sophisticated presentations such as animations or text-specific feedback provisions need to be created using exterior multimedia authoring programs. These materials cannot be added in a hard copy booklet.

#### **Applications of Moodle:**

- 1) It can provide material for trainees and students. The material can be divided according to requirements.
- 2) Assessment of trainee and students.
- 3) Useful for every subject teacher or trainer.
- 4) Moodle is the world's most widely used learning management system.
- 5) Moodle is a massively successful open-source project.
- 6) Core Moodle has a robust set of teaching & learning tools.
- 7) Moodle has thousands of regular community contributors pushing the product forward every day.
- 8) Moodle is free for anyone to download and support, but resources are necessary to maintain the system.

#### **MOODLE Access Mechanism:**

Moodle uses a role based access mechanism, and implements three major roles: administrator, teacher, and student. A user can be given any of these roles. A user can be a student in one course, and a teacher for another. A teacher can also be the system administrator. Only those with an administrator role can control and create courses or assign teacher role to others or assign administrator role to anyone else. When a user enrolls in a particular course then the student role will be given.

Moodle provides four types of access mechanism for students to join a course. The simplest method requires no authentication and allows any user to join the course. The second is a guest user mode where the user can go through the course, but cannot participate in any activity. The third mode requires the teacher to enroll each student directly one by one. In this mode the teacher has full control in adding or removing students. Both enrolment and expulsion are done through a simple interface that can be accessed through the participant link on the homepage. It shows a list of all valid users on the system and the list of current students. The fourth option uses an enrolment key set by the teacher. The teacher must share this key with all his students. Students must provide this key on their first entry to enroll them in the course. If the key is valid, the enrolment is complete, and further access does not require the key. Once all students are enrolled, it is better to change the enrolment key to prevent misuse. If any 'unwanted' student enters the course, the teacher can expel him as mentioned earlier. All these operations can be done by choosing the "settings" option in Moodle course page.

#### **Moodle Usability:**

Moodle interface is very user-friendly. Once the Moodle page gets opened we can customize the Front page by clicking Edit settings under Settings. For all editing purpose we have to first turn editing on under Settings (Dougiamas, M., 2001). We can add Full site name, Front page summary etc. which appears on the front page of the Moodle site. We can set theme for our site like Afterburner, Arialist, Formal white etc. To change the theme, click

Site administration-Appearance-Themes-Theme selector. If we want logo to appear on the front page we can add in the theme's custom front page logo option. User creation: Admin can create users by giving username, password, mail-id etc. by clicking users under Site Administration. The details can be updated by the concerned user under profile option after logging in. Any number of users can be created. Users are the one who play a vital role in accessing the Moodle site. Course creation: Courses can be created by clicking Courses under Site Administration. Any number of courses can be added and sub-category can also be added.

### **Basic Features and Operations of MOODLE:**

The basic features of Moodle include tools for creating resources and activities.

**The Resources Tab:** offers the tutor a choice of creating labels which are simply headings for each topic or week, creating text pages or web pages with a combination of text, images and links, creating links to files or web sites/pages which can link to videos and other files, creating directories which are folders.

**The activities Tab:** which includes: assignments, chat, and choice (one question with a choice of answers – answers are logged so statistics can be deducted), database which is a table created by the tutor and filled in by the students.

**Discussion Forum:** where everyone can post in response to discussion threads, glossary a type of dictionary created by the tutor with terms used and their meanings. Lessons offer the flexibility of a web page, the interactivity of a quiz and branching capabilities. Quiz enables the creation of various types of quizzes, survey is a questionnaire which gathers feedback from students, and wiki is a web page edited collaboratively. SCORM is a tool for enabling SCORM packages into the content that is packaged content which can be used on any Virtual Learning Environment.

News will be posted in news forum where the student can know about the current events happening in the world. Also announcements related to student's activity will be posted like payment of Semester fees, Exam fees, Seminars, Workshops, Examination date, Department activities etc.

**Chats:** Chats can be created for each subject and the users can discuss on the subject by chatting with the staff or with other peer users.

**Blogs & Wiki:** Teachers and students can work in a collaborative environment using blogs and wikis. For each subject blogs and wiki can be added. Student can create her own blog.

**Glossary:** Glossary can be added for each subject where it serves as dictionary and also easy for students to get definitions for some difficult terms.

**RSS Feed:** stands for Rich Site Summary. News feed from websites can be included in front page of the Moodle site. Websites which support RSS can be identified by the icon in their webpage. Students can view the RSS News feed and know about the latest events happening in and around the world.

**Layout:** Moodle is flexibly displayed in a module-based fashion. New functions can be created and activated by choosing the module from the “blocks” pull-down menu and can then be moved to the location that you decide. (Rice, 2006).

**Assignments:** Students can upload assignments that is been given to them and they have to upload it within the time bound. By this the students are free from writing the assignment in paper and submitting. Since time bound is set the student is forced to submit their assignment within the particular date, failing to submit makes them to get zero marks. For adding assignment, click on add an Activity or Resource and add select Assignment.



**Quizzes:** Moodle allows for alternative to assessment strategies. The quiz module includes the following response types: fill-ins, multiple-choice, true-false, matching, short-answer. (Brandle, 2005)

**Cooperative Learning:** Moodle, designed with the social constructivism of learning, offers a lot of useful tools such as Wikis, forums, chats, blogs, and workshop so that teachers can apply different formats of social interaction and collaboration to their teaching. Students can be divided into subgroups (either visible or separate), interact with each other synchronously in chat activities, or engage in asynchronous discussions in Wikis and forums. All the written 'dialogues' in chat rooms can be kept for later reference. (Wu, 2008)

### **Course Management:**

Moodle is a powerful and eclectic LMS in which administrators can fully control its functions. Students' activities can be kept in logs so that teachers can check what students have done on Moodle later and teachers can fully control the deadline and timeframes for assignments - quizzes, forums, chats etc. (Cole, 2005).

There are three different formats for the course – Weekly, Social and Topic. The weekly format organizes the course into weeks, with assignments, discussion boards, tests, etc., all residing in a week-by-week block. The Social format is built around a forum, which is good for announcements and discussions. The Topic format organizes everything by topics, regardless of how long they are. Our courses are in topic format. They are used for e-learning by our students, who use the resources by logging into the college web site <http://www.ctshinas.edu.om> and the choosing the link E-learning.

The class notes can include lecture slides, documents in any format (PDF, HTML, DOC, etc.), videos, audios, animations, graphics, etc. in the content. Depending on the format chosen, we can organize the content topic wise or class schedule wise. Content can have different sub titles such as introduction, overview, survey, illustrations, animations, discussions, etc. Content must be prepared to ensure that there is something of interest to the weakest in the class and the brightest. Content should be visual and interactive and not heavily textual. The 'add resource' link on each block provides a range of options for adding content. File upload, hyperlink to web pages elsewhere as well as provision to create own web pages are provided. Course management can be changed by teacher and administrator. They have full control over all settings for a course, including restricting other teachers.

### **Interaction:**

The effectiveness of the e-learning system depends on the level of interaction provided among the students and tutors. In Moodle all announcements relating to the course are made through news forum. We can add such discussion forums through the 'add activity' link in each block. Forums are quite versatile interaction and learning devices, when used carefully. We can ensure that comments and participation from students are responded through appreciation, relevant counter comments, constructive suggestions, etc.

One could also consider giving credit to participation in forums as part of the internal assessment, to further drive up the interest. Moodle has other communication mechanisms such as chat, mail, etc. as well. We can set up the discussion board so that if anyone posts a response to our post, we can get an email. This can be used to remind us to check the system as and when there is something happening, instead of polling the system frequently looking for updates. The teachers can pose questions for discussion, encourage students to ask questions online and respond online. This, not only serves as a repository of interaction that other students can refer and use, it also encourages further interaction among students, clarifying and enhancing the discussion. Posing self-test questions on major sections of the course is also useful as a feedback to the students.

**Present Scenario:**

Most of the higher educational institutes in foreign countries offer LMS, the new paradigm of teaching learning. But in India only few Universities and colleges offer teaching-learning through LMS. This is because of the lack of knowledge and awareness of the new paradigm. It takes time and effort to implement this new system of teaching-learning. Higher Educational institution can go for open source software as the cost of the software is less and the institute can have control over its future (Wheeler, D. A., 2003. Coppola and Christopher D. 2005). Moodle has been selected because it is one of the most frequently used LMS and enables the creation of powerful, flexible and engaging online courses and experiences. This system runs on most webhost providers, and includes a constructivist (knowledge is generated through mediation and interaction with the environment) and social constructionist (learning by doing) approach to education (Perkins, M. and Pfaffman, J. 2006). So many reports have proved that Moodle rates well and is being used in a number of institutions and has a wide variety of active courses, available in many languages (Cole, J. and H. Foster. 2007. B. Williams and M. Dougiamas., 2005).

**Effects of LMS Moodle:**

**Improves Learning Skills:** Learning through LMS improves learning skills of a student. In a LMS, the student is expected to go through from the beginning of the semester the forums, chat, blogs, quiz and as a result they get fully exposed to the subject and can improve their learning skills (Nair.S. C. and Patil., R. 2012).

**Promotes Content Development:** It is necessary to have a web presence as it would promote content development related activities (Hamish.C et al., 2005).

**Improves Self Efficacy:** Learning through LMS can help a student to improve self-efficacy. The students individually have to respond to questions posted in blogs, forum and chat. So they think and act and learn better. Since students have peer-group interaction their interest grows and learns better (Martin et al., 2010).

**Improves Self-discipline:** When a student learns through Moodle e-learning environment, it helps to develop their self- discipline (Siirak.V., 2012).

**Improves Communication:** When students interact with faculty, peers through blog, forum, chat their communication skill gets improved.

**Conclusion:**

The implementation of the information and communication technology in education with e-learning through Moodle allows improving effectiveness and efficiency of the education. It saves lot of time, it is available 365 days in a year 24/7 basis to the learners. Facilitator will get more time to interact with students in the form of doubts clarification, sharing of knowledge to provide more information about the topic etc. E-learning allows better cooperation among the learners, the tutors and the students. The accessibility, usability and student collaborative learning can be improved and higher motivation among the students and the teachers can be achieved with E-learning.

The teachers with more teaching experience may have more confidence to use OLEs in a constructivist way. Moodle facilitates student-centered and anytime-anywhere learning. Moreover, it makes course administration easier and helps to reduce the cost and time of delivering instruction.

Traditional classroom teaching is often teacher directed and students can make only less contribution, if the class strength is large. However the online environment allows the students to contribute their learning experiences as they achieve both intended and unintended learning outcomes. LMS makes a student to be beyond the space/time constraints in teaching-learning process. We are approaching the age of Self-learning without which students;

thereby teachers also may find it difficult to survive (Kesim.M. and Pulluk. H.A., 2013). Moodle can be preferred to build simple, low cost Learning Management System which doesn't require much complex features. Since its open source, Moodle can be used by the higher educational institutes for teaching-learning process.

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