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Influence of Moodle Learning Management System on Student Satisfaction in Learning University Common Units: A Literature Review

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Abstract:
Modular Object Oriented Dynamic Learning Environment (Moodle) is an open learning management system (LMS) widely used in mediating eLearning programmesin higher institutions. Research studies available indicate Moodle LMS has dominated open, distance and online learning discussions from year 2000 up-to-date globally. The aim of this literature review is to interrogate the influence of Moodle features on student's satisfaction at higher education institution. Evidence from this review suggests that although Moodle LMS is an inferior LMS compared to others, it is still popular within academic circles due to its features. Due to variations such as student's characteristics, institutions related factors, quality of eResources, teachers related factors among others this leads to variation on satisfaction levels among the learners. Therefore, there is need to explore the influence of Moodle features such as ease of access, interactivity, communication, feedback and evaluation tools features influencing student's satisfaction.

Keywords: Moodle, modular object oriented dynamic learning environment (Moodle), learning management system, elearning, moodle features, and student's satisfaction

1. Introduction

Modular Object Oriented Dynamic Learning Environment (MOODLE) is an open source learning management system used as platform by institutions in offering online learning. It is free software that provide eLearning solutions to many organizations and institutions globally. According Young (2018), Moodle was developed by Martin Dougiamas in 1999 while working on PhD project as student at Curtin University of Technology in Australia. Opentextbooks.org, (2015) noted that Martin was frustrated by proprietary LMS which had many bureaucracies before any user could adopt for use which made him to develop moodle that became available for any user from year 2002 onwards. Singh (2015) observed that Moodle LMS has over 78 million users distributed in 222 countries globally.

Research studies have documented use, pros, cons, challenges and the future trends associated with moodle LMS that has led to mixed reactions in terms of perceptions, experiences and satisfactions among its users. Leading education institutions in the world have abandoned Moodle to alternative superior LMS but some institutions have scaled up the use of Moodle to date. Therefore, there is need to examine Moodle features that influences student's satisfaction.

This literature review is divided into three parts. The first part will focus on the overview of Moodle learning management system. Second subheading will explore present information on Moodle satisfaction. The last and the third part will focus on Moodle LMS features such as: Ease of access and students' satisfaction, Moodle LMS Feedback and student's satisfaction, Moodle LMS communication features and student's satisfaction, Moodle LMS interactivity features and student's satisfaction and finally Moodle LMS evaluation features and student's satisfaction.

1.1. Overview of Moodle Learning Management System

According to Davis, Carmean and Wagner (2009) Learning Management Systems (LMS) are enterprise technologies that emerged directly from the e-Learning industry in late1990's. A survey report by eLearning guild research in 2007 noted that; higher institutions in USA including colleges were leading in usage of LMS.In May 2008, another survey carried out by eLearning Guild indicated that Blackboard and Moodle were most popular LMS being implemented in USA (Davis *etal* 2009).Beatty & Ulasewicz (2006) on the other hand confirmed that Moodle LMS is widely used in colleges and institution in the world.

Singh (2015), established that Moodle LMS is the most popular open sources LMS used in the world with over 78 million users distributed in 222 countries globally. This is also confirmed by countries highlighted in moodle .net (2019) which have adopted Moodle LMS. Young (2018) observed that Modular Object Oriented Dynamic Learning Environment (MOODLE) LMS was developed by Martin Dougiamas in 1999 while working on PhD project in education. This software later spread to other parts of the world including Africa.

Lopes (2017) and Poulova, P., Ivana S, and Manenova M. (2014) cites that Moodle LMS is popular because: It is a free web application that educators use to create effective online learning sites, easy to install, can run on a common computer, tablet or smartphone equipped with a web viewer connected to the Internet, does not require frequent updates, does not limit the number of users and give power to the teacher to manage the platform according to class needs. This might be the reason why some public universities in Africa including Kenya have adopted because of its cost effectiveness.

MOODLE being a popular LMS has the several features. Cavus & Zabadi (2014) points out that Moodle has real time chat, a journal module,a skype and interactive board. It is also easy to upload and access files compared to other open source LMS such as Sakai, Dokeo, Claroline, A Tutor and Ilias. (Cavus &Zabadi, 2014). These features enable interact with eResources making them active and able to construct meaning rather than being a passive learner (Fullan and Langworthy 2004). As they continue explore eResources and interacting with others online they are able to create knowledge as expounded by advocates of constructivism learning theories. Principles guiding moodle include: It enhance academic integrity, the design adopt scaffolding approach, allow learners to prepare personalized assessments, the design also motivate and challenge students to collaborate, interact and share eResources. (Glynn, 2018)

Although several studies have shown Moodle LMS has many users globally, Phil and Menard (2016) observed that Moodle LMS is no longer popular and does not feature among the top five LMS in top 50 online programmes in USA. Center for Education Innovation Report (2017) also concur that Black Board Learn and Canvas are the leading LMS in higher education in USA while Moodle occupied 3rd position commanding a market share of partly 16.4%. These means higher institutions in developed nations are replacing Moodle with other learning superior management system.

1.2. Present Information on Moodle Satisfaction

Silva, Nunes, Sousa and Cabral (2017) highlights tutor, technology, and interactivity as the three main factors that influence the students' satisfaction using Moodle. The speed of availability of content and accessibility of Moodle LMS platform were two items where over 50 % of students were satisfied at University of Azores, Portugal. Mtebe and Raphael (2018) on the other hand asserts, that system quality, instructor quality, and service quality has significant positive effect on learners' satisfaction, with service quality being the strongest predictor. Learner normally tends to gauge Moodle satisfaction of an entity based on quality of a service received.

Santamaria, Antolin and Pardo (2012) on the other hand focused on student's perception on the usage of Moodle at University of Castilla-La Mancha, Spain and noted that there is direct relationship between Moodle usage and degree of satisfaction on Moodle tools such as Uploading tool, data base, forum, wiki, email, chat, questionnaire, glossary, survey and calendars. Ghoyal and Purohit (2011) also noted Moodle LMS significantly improved students' satisfaction. This statement is in agreement with findings reported by Pektaş and Demirkan, (2014) who noted that more students were satisfied with Moodle communication tools but also cited that these tools were not as intuitive as face-to-face communication. Nauman and Zuhoor (2012) on the other hand observes that students at Sultan Qaboos University enrolled in basic computing skills classes were overall comfortable using Moodle because of its accessibility by internet at any location.

Horvat, Marina, Maja and Mladen (2015), on the other hand observed that female students paid attention to the following moodle quality: average waiting time for a response, feedback quality, material thoroughness, material clarity, website user-friendliness, cooperation diversity, and material quantity compared to their male counterparts. Studies by Marko, Welzer, Lily and Sevcnikar (2011) observed that 92% of students are satisfied with privacy in Moodle. This is in contrast to findings by Baile (2013) who noted that, majority of students in Australia complained that it is difficult to navigate using Moodle because its design is confusing and horrible. These statements strongly indicate learners are not satisfied with Moodle LMS design as used in teaching and learning. Ally (2016) on the other hand noted that lack of interactivity in the system caused by poor MOODLE customization and configuration, improper content design and integration with add-on multimedia files at Open University in Tanzania.

1.3. Moodle LMS Features

1.3.1. Moodle Ease of Access Feature and Students' Satisfaction

It is generally perceived by learners that successful login to eLearning portal creates a sense of inner satisfaction and may also lead to frustration if one cannot to access the VLE that delivers online learning. A study by Pektaş and Demirkan (2014) established that 87.6 percent of students agreed that it is easy to access and use Moodle LMS. This finding concurs with another one conducted by Silva, Nunes, Sousa and Cabral, (2017) where they established that accessibility to the Moodle LMS platform was the item with the highest percentage of students who are satisfied or very satisfied.

Hongjiang and Mahenthiran (2015) observed that overall student satisfaction with online learning is significantly affected by how the course is organized and how the content is sequenced, the ease with which students can complete assignments, and the use of the LMS to engage with content. Study by Wezer (2010) established that students were able to access teaching material and exercises from virtually anywhere without geographical restrictions using Moodle LMS. Horvat etal(2015) on the other hand demonstrated that there was a statistically significant difference among student in terms of satisfaction based on average response waiting time to performing an activity in Moodle LMS.

Hadullo, Oboko and Omwenga (2018) noted that 56 percent of JKUAT post graduate students were satisfied with assignment management offered through the Moodle LMS. This implies a big proportion of leaners are still struggling with Moodle LMS.

1.3.2. Moodle LMS Feedback Feature and Student's Satisfaction

According to futurelearn.com (2018) feedback given to leaners must be constructive, timely and meaningful. Centre for innovation in Research and Teaching at Grand Canyon University (2018) notes that feedback increases learning and improve student outcomes, allows the student to become more engaged and involved in the classroom. Nagi, Suesawaluke and Poonsri (2008) on the other hand assert that students become motivated by actually viewing their grade hence provides feedback for their performance.

Moodle LMS is capable of providing feedback from students especially when linked to databases where learners are able to get scores on test and quizzes attempted at the end of a topic or subtopic. This kind of feedback is instant unlike from the instructor where feedback is mostly delayed. Studies by Akakandelwa and Mkulama (2017) revealed that lack of timely feedback from lecturer is associated with Moodle LMS.

1.3.3. Moodle LMS Communication Tools and Student's Satisfaction

According to (umass.edu,2018), Moodle communication tools include: the announcements forum, email, Moodle profile settings, discussion forums, the upcoming events block and calendar block andgroup communication and collaboration spaces. Lopes (2017) observed that Moodle has inbuilt communication tools (refer fig 1a) that allows students to communicate with instructors and team members. Pektaş, Demirkan (2014) agree that communication tools allow online critiques, downloading course materials, designing briefs, submitting design sketches and design projects.

Kotzer and Elran (2012) on the other hand established that Moodle communicates extremely well with many web-based resources such as Facebook, YouTube, Wikipedia, and JClik. These communication interfaces are currently popular among the students where they spend most of their time accessing information and interacting with their peers. Welzer (2015) disagree with previous finding and asserts that communication features such as forums, chats, blogs, wikis, and other similar elements remains unused students using Moodle LMS. Zoran & Kati (2010) also asserts that wiki tool is not student friendly hence partially used by learners.   Kakasevski, Mihajlov, Arsenovski &Chungurski (2008) also noted that 80% of students did have significant problems with features of online chat because some of the modules uploaded to Moodle LMS were not well developed. This indicates higher level of discontent among the students because the chat tool limits communications among themselves.

1.3.4. Moodle LMS Tools Interactivity and Student's Satisfaction

Anistyasari, Sarno and Rochmawati (2018) and Behringer (2013) defines the interactivity as the ability of different computer systems, applications or services to communicate, share, exchange data, information and knowledge in a precise, effective and consistent way. This is actually true because for learning to take place learners must access and interact with eResources, communicate with classmates or the instructor and share information using Moodle platform. Studies by Koneru (2017) highlights two main types of interactive activities namely: technologically simple interactions and technologically complex interactions. Simple interaction includes polls, quizzes, drag and drop, flash cards, memory games, hotspots, while complex interactions encompass interactive videos, animations, gamifications and scenario, based, simulations. The above shows interaction of learners with the content that can enhance retention and making learners to be active.

Anderson, (2016) observes that Moodle is very beneficial for language teaching and learning because of the interactive tools, such as wiki, discussion forums and quizzes which engages the students throughout. These in-built Moodle tools and features facilitate interactivity that helps learners to search for information, interrogate, collaborate and construct meaning in their specific subject of study.

Zoran & Kati (2010) observes that Moodle offers a wide array of various tools/widgets that may be added onto the virtual learning environment, utilizing various pedagogical approaches based on socio-constructive principles towards creating more interactive and appropriate content for the users in the course. Although moodle is endowed with tools that enhances interactivity, studies by Ally (2016) and Odhiambo& Acosta (2009) opined that majority of LMS including moodle lacks critical aspect of interactivity among learners enrolled in the same course, between learners and their respective tutors and also between learners and system contents interfaces.

1.3.5. MOODLE LMS Evaluation Tools Satisfaction

According to Moodle .org (2018) and university of South Wales, Sydney (2018) highlights the following are evaluated to gauge the efficiency of Moodle VLE. They include eResources, activities, tracking progress, grade book, Course reports, choice and workshops. Tools such Quizzes, test, assignment among others can check learner's progress. Number of hits and views are also used to gauge the engagement of learners with eResources.

Deepak (2017)) noted lecturers from Kajaani University of Applied Science use assignment, feedback, forum, lesson and quiz for evaluating the learners. Nagi *etal* (2008) observes that reports generated by Moodle LMS can be used as evaluation tool by instructors. Learners can also view their progress reports including grades hence motivating them.

Studies by Warab, Thomas, Ali & Hassan (2013) established that 76.9% of students thought that the moodle assignments were easy to download and a further 73% reported that assignments were easy to submit. This means the satisfaction ratings on assignment tool is popular with students. Jeljali, Al Naji, & Khazam, (2018) on the other hand did a study to compare Moodle, Facebook, and Paper-based assessment Tools on students and they established that Moodle tools were rated the top, followed by paper-based learning, then Facebook. This indicates students are more satisfied with Moodle tools compared to the rest.

2. Summary of Literature Review

Learning Management System emerged in late 90's to enable online learning to take place. Moodle LMS was developed by Martin Dougiamas in 1999 (Young 2018).

Moodle LMS among popular LMS used in delivering online learning (Lope, 2017; Singh, 2015; Davis, Carman and Wagner ;2009). It is a free web application, easy to install, does not require frequent updates, compatible with ICT equipment's, enable trainers to manage learners and learning activities. Although it has above advantages, studies by Baile (2013) noted that a section of Australia university students discredited Moodle as a horrible, complex and confusing design. While Borruet, Mengich and Kangethe (2014) finding ascertained that Moodle design is friendly, flexible and enable health science students to learn at their own pace. Their findings were in agreement with Sancar and Calgiltay (2008) who noted that moodle design was friendly, adaptable and has a provision for feedback. Silva, Nunes, Sousa and Cabral, (2017) and established that accessibility to the Moodle LMS platform was the item with the highest percentage of students who are satisfied or very satisfied.

Lopes (2017) and Pektaş and Demirkan (2014) highlights MOODLE communication tools (refer Fig 1a). Welzer (2015) on the other hand noted this communication tools remains unused by majority of online learners using Moodle. Kotzerand Elran (2012) established that Moodle communicates extremely well with many web-based resources.

Studies by Nagi, Suesawaluke and Poonsri (2008), futurelearn.com (2018) and Centre for innovation in Research and Teaching at Grand Canyon University (2018) articulated that feedback features are important to learners to gauge their progress, motivates them and allows them to become more engaged and involved in the classroom

Koneru (2017) highlights two types of moodle interactive activities: simple and complex interactions. Studies by Ally (2016) and Odhiambo and Acosta (2009) noted majority of LMS in public universities in lacks critical aspect of interactivity whereas Deepak (2017)) noted lecturers from Kajaani University of Applied Science use assignment, feedback, forum, lesson and quiz for evaluating the learners because they are considered to very essential.

3. Conclusion

Moodle features such as communication tools, interactivity feature, feedback features, evaluation features and ease of access may also have a bearing to student's satisfaction level using Moodle LMS to access eLearning. Tools such as assignment, feedback, forum, lesson and quiz are used in evaluating the learners.

There is mixed reaction among leaners using Moodle LMS globally. Factors such as quality of instructors, and eResources, learners' support, ease of access portal, ergonomics of portal page, internet related factors and learners related factors influences use of Moodle features and subsequently satisfaction level.

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