



The Contribution of LMS to the Learning Environment: Views from the State University of Zanzibar

Mwanajuma Suleiman Mgeni¹(✉), Maryam Jaffar Ismail²,
Said Ali Yunus², and Haji Ali Haji¹(✉)

¹ Department of Computer Science and Information Technology,
The State University of Zanzibar, Zanzibar, Tanzania
{m.mgeni, haji.haji}@suza.ac.tz

² Department of Education, The State University of Zanzibar,
Zanzibar, Tanzania

Abstract. Learning Management Systems (LMS) have become a common feature in contemporary higher education institutions globally. In recent years, LMS have been adopted in some higher education institutions in sub-Saharan Africa including Tanzania, however, there are limited research in this area, which could hinder future developments. Therefore, this study investigates the adoption and usage of LMS as pedagogical tool among students and instructors at the State University of Zanzibar (SUZA). The methodology used in this study included the review of the literature, focus group discussions and semi-structured interviews. The study was conducted in Zanzibar from March 2016 to March 2017. A total of 431 students and 10 instructors participated in this study. The participants were selected based on the courses that have been involved in the pilot study. Microsoft Excel was used to present the findings in figures and tables. The findings reveal that 70% of instructors and 44.4% of students showed preferences to LMS system as a tools to be used in teaching and learning and 26.1% of students were neither agree nor disagree. However, there are various challenges influencing the level of use of LMS including, internet connections, access to computers, unfamiliar with Moodle and integration of LMS with others university systems. Overall, the study provided an insight into the environment surrounding the early adoption phases of LMS in SUZA, which offers a better understanding of the phenomenon. Subsequently, this will help enhance the adoption process in current contexts and assist in future utilization of LMS systems.

Keywords: Learning management systems · Higher learning institution · e-Learning · Blended learning · Zanzibar

1 Introduction

This paper discusses the contribution of Learning Management System (LMS) to the learning environment from the academia perspective of the State University of Zanzibar (SUZA). The paper is organized as follows: Sect. 1 introduces the topic, including

theoretical background of the study, Sect. 2 describes the methodology of the study. Followed by the presentation of the results and discussion of the study in Sect. 3, and finally the conclusion and recommendations in Sect. 4.

1.1 Theoretical Background

Learning Management Systems (LMS) have been adopted in most higher education institutions in sub-Saharan Africa. These web-based LMS are intended to support teaching and learning activities in a traditional classroom. LMS consists of various features that enable university instructors to share learning materials as well as providing interaction with their students both synchronously and asynchronously. Currently, there are various LMS available worldwide, and common LMSs be largely grouped into two groups: first, Open-source LMS, such as Moodle, Sakai and Segue, and second, Commercial systems, like WebCT, Blackboard and Desire2Learn [1]. The most widely adopted LMS in sub Saharan Africa are Blackboard, Sakai, and Moodle [1].

LMS is a collaborative platform used to manage online learning courses. LMS is a software environment that enables the management and delivery of learning content and resources to students. It provides an opportunity to maintain interaction between the instructor and students and to assess the students by providing immediate feedback on the online quizzes [2]. LMS presents an overview of common motivations for e-learning. E-learning is organized and managed within an integrated system. Different tools are integrated in a single system, which offers all necessary tools to run and manage an e-learning course. All learning activities and materials in a course are organized and managed by and within the system. LMS typically offer various activities including discussion forums, management of assignments, file sharing, chats, and syllabus [3].

In traditional lectures, an instructor stands before a class take a centre stage, recite a paper or read part of the book that contains all that is considered important for the students to know, and may resort to use chalkboard [4]. As technology grows, the model changed to using presentation cues in Microsoft Power Point slides visible to all students rather than in notes used only by the instructor. However, the most important mode of verbally exposing information to the students remained. This model has been criticized because of its assumption that dissemination of content is the primary purpose of a classroom. It has been argued that, instead, such content is better learnt on an individual basis and the classroom sessions are better utilized for discussion and active engagement with the content [5, 6]. This in turn could lead to higher levels of understanding than if classrooms are used purely for presentation of the content to students.

In this regards, LMS usability, flexibility, and accessibility for use in 24/7 are the most significant characteristics that have attracted both students and instructors [2]. LMS allow communication and interaction between teachers and students in virtual spaces. However, the literature indicates that there are gaps in research, especially in the management of platform and its associated opportunities and challenges. Consequently, the aim of this study is to assess the perceptions of using LMS as pedagogical tool among students and instructors at SUZA, specifically the study looks at LMS features used by students for learning and its challenges.

SUZA recognizes the pedagogical role of Information and Communication Technology (ICT) in improving the quality of the learning environment. Several initiatives emerged at SUZA through Centre for ICT services to boost ICT capacity and effective utilization in teaching and learning. The centre for ICT services engaged in several initiatives including building and maintaining a robust infrastructure to support student learning. Among the recent measures that took place at university include the increase internet bandwidth, equipping computer labs, establishment of e-library, LMS (Moodle), and ICT policy.

In 2014, SUZA with support from Build Stronger University (BSU) II project through work package 3 (ICT in Education) embarked on an activity “Pilot Implementation of e-modules through LMS for selected courses”. The courses selected in this implementation are shown in Sect. 3.1. The participants of this activity were students enrolled in the courses and instructors who are teaching the courses. However due to various infrastructural challenges not all students were accessing the developed e-modules. Thus, this pilot study involved the students who were using the e-module in academic year 2016/2017 in different semesters.

2 Methodology

The main aim of this research is to investigate the perceptions of using LMS as pedagogical tool among students and instructors at SUZA, with a specific focus on teaching practice as manifest when using systems. Focus group discussions and semi-structured interviews were used as data collection tool for this study. The interviews contained both open and closed-ended questions. Later, the participants were interviewed to gather their perceptions on using LMS for their teaching and learning activities.

2.1 Sample and Sampling Techniques

Currently, SUZA has seven campuses in Unguja and Pemba islands. The study was conducted between March 2016 to March 2017 in three SUZA campuses Tunguu, Vuga and Nkrumah before the merging of other institutions. Random sample technique was used to select a number of students and instructors at university. Eight courses were selected as indicated in Sect. 3.1. Instructors were trained on how to upload course materials to the LMS platform. They then trained students on how to use the Moodle such as downloading materials, participating in online discussions, and quizzes. A total of 10 instructors and 431 Diploma and Bachelor degree students participated in the survey. The questionnaires were designed and integrated into each course to assess levels of students and instructors’ satisfaction with the LMS.

3 Results and Discussion

3.1 Profile of the Participants

Table 1 shows the demographic information of students' participants. A total of 431 Diploma and Bachelor students (first year, second year and third year) participated. More than half (50.3%) of the participants were male and 49.7% female. The participants were of different ages. The majority of them, (66.1%) were aged between 21 to 25 years. Most of the participants, were the second year students (79.1%), followed by first year students (13%), and third year students comprised 7.9% of the participants. The participants were selected from nine programme as shown in Table 1.

Table 1. Demographic information of student participants (n = 431)

Parameter	n (%)
Gender	
Male	217 (50.5)
Female	214 (49.7)
Age	
16–20	7 (1.6)
21–25	285 (66.1)
26–30	85 (19.7)
31–35	37 (8.6)
36–40	15 (3.5)
40+	2 (0.5)
Year of Study	
First Year	56 (13)
Second Year	341 (79.1)
Third Year	34 (7.9)
Study Programme	
Bachelor of Science in Education (BSE)	64 (14.8)
Bachelor of Art in Education (BAE)	161 (37.4)
Bachelor of Art in Kiswahili and English (BAKE)	23 (5.3)
Bachelor of Medicine (MD)	62 (14.4)
Bachelor of Science in Computer Science (BSc. SC)	10 (2.3)
Diploma in Information Technology (DIT)	54 (12.5)
Diploma in Computer Science (DCS)	6 (1.4)
Bachelor of Information Technology with Education (BITED)	14 (3.2)
Bachelor of Science in Environmental Health (BSc. EH)	37 (8.6)
Campus	
Tunguu	262 (60.8)
Nkurumah	105 (24.4)
Vuga	64 (14.8)

Table 2 shows the demographic information of instructor participants. Ten (10) instructors participated in this study, where 70% were males and 30% females. The Instructor participants were of four different groups of age, between 36–40 (30%), age greater than 40 (30%), between 31–35 (20%) and age between 26–30 (20%). Furthermore, the instructors were taught different level of education as shown in Table 2.

Table 2. Demographic information of instructor participants (n = 10)

Parameter	n (%)
Gender	
Male	7 (70)
Female	3 (30)
Age	
26–30	2 (20)
31–35	2 (20)
36–40	3 (30)
40+	3 (30)
Department	
Education	4 (40)
Science	1 (10)
Computer and IT	4 (40)
Social science	1 (10)
Level taught	
Degree	5 (50)
Diploma	2 (20)
Both	3 (30)

Students from different programmes were allocated to various courses which they are registered for pilot implementation. There were eight courses involved in the study of the LMS and number of students participated in the bracket as follows: DS 1101-Development Studies (47), CL 1101 Communication Skills (38), ED 1201-Educational Psychology (5), ED 2103-Educational Resources, Media and Technology (262), CS 0119-Interactive Website Development (60), CS 3106-Distributed System (10), EH 1204-Sociology of Health and Illness (17), and EH 2111-Waste and Waste Management (18).

3.2 Frequently Utilized LMS Features

LMS Moodle contained different features such as quiz, forum, file and video uploader, multiple media, resources, enabling alternative technologies, and presenting information in an organized manner to fulfill its main purpose, which is the construction of learning through interaction.

Figures 1 and 2 show various activities performed by participants while accessing the Moodle. Figure 1 shows activities performed by students which depict that downloading of Power point lecture materials was a major activity when students interacted with the Moodle. This is because downloading materials was convenient for the majority of them since they do not have internet access at their homes.

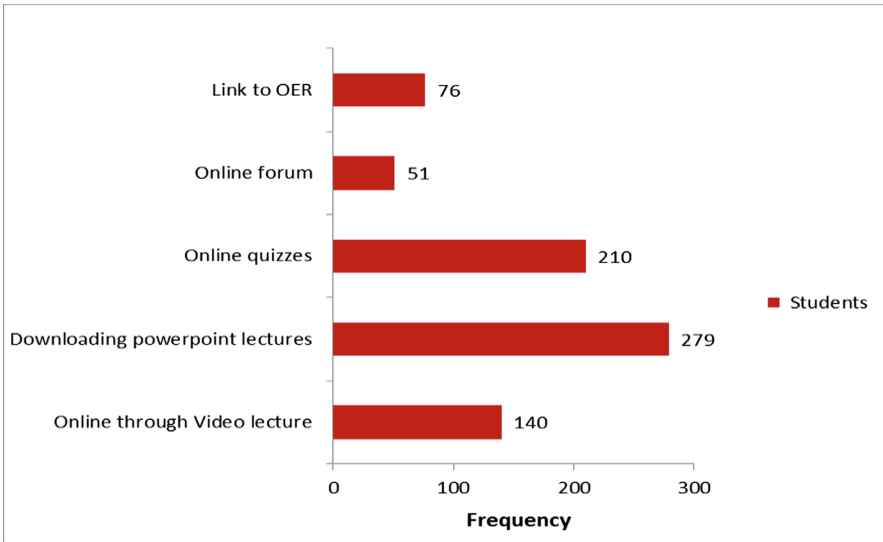


Fig. 1. Features used by students in Moodle

Figure 2 shows activities performed by instructors. On the hand, it is revealed that most of the instructors used the LMS for uploading Power point lectures, uploading online video lectures and post online assignments, as indicated in Fig. 2.

The data in Figs. 1 and 2 further reveal that ‘share simulation’ and ‘uploading Power point with speak’ were the activities that performed less by instructors while link to external online quiz found no one was using among instructors. Additionally, both figures show that instructors applied many features compared to students this is because the instructors are major actors of the module who create learning activities to students.

3.3 Perceptions on the Use of LMS Platform

The participants were given several LMS aspects to identify their perceptions as shown in the Table 3. Some of these aspects were directed to both students and instructors and others were directed to either students or instructors. The results indicated that 70% of instructors and 44.4% of students indicated that they preferred the LMS to the traditional way of teaching and learning. However, 30.4% of student neither agree nor disagree. This finding therefore show that students learning is better supported by LMS indicating interest in digital learning. Concerning the availability of LMS, 55.5% of instructors and 46.8% of students agreed that the LMS was available. Regarding

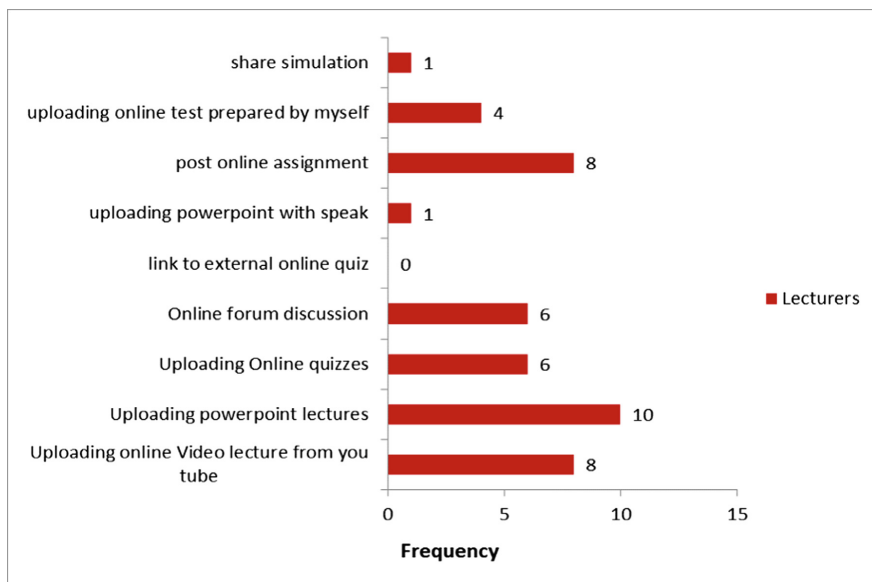


Fig. 2. Features used by instructors in Moodle

accessibility of LMS in ICT devices (laptop, smartphone), 90% of instructors and 47.3% of students' report that it was accessible. Moreover, 70% of students and 37.7% of instructors responded that they had adequately technical support during the use of LMS. Other aspects are illustrated in Table 3.

Table 3. Instructors' and students' perceptions on the use of LMS for teaching and learning

No	Perceptions	Respondents	Agree n (%)	Neutral n (%)	Disagree n (%)
1.	I have adequately technical support during the use LMS	Instructors	7 (70)	2 (20)	1 (10)
		Students	157 (37.5)	135 (30.4)	125 (30)
2.	The Learning Management System was accessible through any ICT device (Desktop, laptop, tablet)	Instructors	9 (90)	1 (10)	0 (0)
		Students	195 (47.3)	90 (21.6)	130 (31.2)
3.	Availability of learning materials in the LMS was 24/7	Instructors	5 (55.5)	2 (22.2)	2 (22.2)
		Students	194 (46.8)	139 (33.5)	82 (19.8)
4.	LMS is too complicated for teaching and learning	Instructors	1 (10)	1 (10)	8 (80)
		Students	134 (32.2)	133 (32)	148 (35.7)
5.	The learning materials delivered through LMS were relevant to this course	Instructors	10 (100)	0 (0)	0 (0)
		Students	143 (34.4)	244 (58.7)	29 (6.5)
6.	The participation of students in my course was very low in LMS than in the classroom	Instructors	2 (20)	4 (40)	4 (40)

(continued)

Table 3. (continued)

No	Perceptions	Respondents	Agree n (%)	Neutral n (%)	Disagree n (%)
7.	I have adequately pedagogical support during course development within LMS	Instructors	7 (70)	2 (20)	1 (10)
8.	I would prefer blended teaching with LMS over traditional (face to face) teaching	Instructors	7 (70)	2 (20)	1 (10)
9.	The course had clear objectives	Students	274 (65.4)	92 (22)	53 (12.7)
10.	I would have preferred LMS than taking down my own notes in class	Students	184 (44.4)	108 (26.1)	122 (29.4)
11.	The online quiz and assignments were graded fairly	Students	215 (52)	114 (27.6)	84 (20.3)

3.4 Opportunities and Challenges of LMS

In this study, LMS seemed to be a potential platform for strengthening teaching and learning. For example, the finding show that second year students in the course “ED 2103” participated well in the LMS to perform learning activities. Therefore, the results indicated that when the instructor committed to use LMS consequently the students will be engaged to frequently use online learning activities. On the hand, several challenges were reported by both students and instructors while using the LMS. These include challenges related to both software and hardware. The most challenge reported was internet connection, including slowness on internet, network failure, unavailability of WiFi in some days and poor internet access at the campuses.

Internet Connectivity at Campus. For example, student A1 stated that “*Sometimes make hard time for us to interact with LMS because of network*”. And instructor B1 stated that “*Lack of resources such as internet lead student to not accessing LMS*”.

Cost Effectiveness. Another challenge reported by participants was cost effective. This incurs the cost of downloading the materials from LMS. This challenge particularly reported by students, they said that always they need internet connection while at home to perform activities related to LMS such downloading any task posted by instructor. The majority of them said that they don’t afford to buy data bundle for the internet services.

Devices. Inadequate number of ICT devices like computers or laptops was also mentioned as challenge faced participants while using the LMS. This is supported by the following statement from instructor B2 “*The big problem of implementing LMS is infrastructure in terms of networking, shortage of lab as well as shortage of learning devices such as computer, ipad, etc.*”.

Time Consuming. Move over, some of students mentioned that LMS is time consuming. They claim that they had limited time to access computer labs for LMS system whilst the most of them had no laptop computers or smartphone that support LMS.

For example, student A2 stated that *“This e-learning system seems good for us and helpful, but the challenge is that some of us don’t have smart phone or laptop and labs are always full”*.

Integration of LMS vs Students’ Information System. Integration of LMS and other University’s system such as students’ information system (zalongwa) was another challenge mentioned faced the LMS systems. The participants raised that after register to the zalongwa they have to register again in LMS in order to get access to services.

Limited Availability of Technical Support. Another challenge raised by both instructors and students was technical support. The participants mentioned that they get minimal technical support on the using LMS. For example, one of the students, student A3 stated that *“The system produce error on php to the students when using after sometime”*. Thus, most of participants suggested that long time training is needed on how to use the LMS features before it deployment.

3.5 Participants Views, Opinions and Recommendations

The participants shared their views on improving the use of LMS for teaching and learning at SUZA. Their responses were directly related to LMS and ICT infrastructures that support the implementation of the LMS. These include availability of the internet and supportive staff. The participants suggested that the internet connection should be available at all time and with high speed, and the University should allocate staff who specifically available for providing support to LMS.

Another suggestion was about a number of computers available at University. The participants suggested that the computers are not adequate to be used for all students at University, thus the University should increase a number of computers to be available for LMS system. Once the computers adequately settled, training on how to use the Moodle and LMS in general should be provided to all instructors and students.

The integration of zalongwa and LMS was also suggestion provided by the participants in order to improve the LMS system. They recommended that once student registered to zalongwa system, it should then automatically grant the access to LMS system without ask students to register again.

Literature suggests that students are increasing using different forms of digital technologies to support their learning [2, 3, 6], however in many developing countries there are a number of challenges associated with perceptions, adoption, and technical infrastructure.

4 Conclusion

Learning management systems (LMS) have been widely used in higher education for enhancing traditional classroom teaching. This study found number of opportunities and challenges associated with the implementation of LMS at SUZA as one of the university in developing countries. Although, SUZA is in the process of deploying the LMS to entire University, the findings of this study indicated that there is need to integrate the Moodle into every course provided by the University in order to easily

support pedagogical activities. However, to do this successfully, the University has to strengthen ICT infrastructure. The findings clearly show that almost half of the participants have keen interest and are willing and believe in the power of the LMS to effectively support their teaching and learning. Although the students who participated in this study showed their willingness to use the Moodle, the findings demonstrated that the overall participation of students was low compared to the total number of students who registered a particular course. The participants proposed that strengthening the ICT infrastructures like computers lab with internet connections, stable power supply and reliable internet will afford them the opportunity to utilize LMS in teaching and learning effectively. Both students and instructors believe that once infrastructural challenges were taken care of, the Moodle can be easily integrated into all programmes and courses at SUZA as a result it will raise student's performance.

The main contribution of this paper is related to the administration of e-learning platform. In order to successfully operate, LMS needs dedicated administrator and technical support. The implementation of LMS necessitates reliable internet and enough computers especially when you have a large number of students. It is also worthy for remote learning environment.

The findings of this study indicate some research opportunities that can be developed, seeking to fill the gaps identified by this study. The implications for the LMS in pedagogy cannot be weighted unless there is a research agenda.

Acknowledgement. We would like to express our sincere appreciation to the DANIDA through BSU II project for funding this pilot study and all participants from the State University of Zanzibar who contributed in one way or another to the work embodied in this project.

References

1. Mtebe, J.S.: Learning management system success: increasing learning management system usage in higher education in sub-Saharan. *Afr. Int. J. Educ. Dev. Inf. Commun. Technol. (IJEDICT)* **11**(2), 51–64 (2015)
2. Bernard, R.M., et al.: A meta-analysis of three interaction treatments in distance education. *Rev. Educ. Res.* **79**(3), 1243–1289 (2009)
3. Black, E.W., et al.: The other side of the LMS: considering implementation and use in the adoption of an LMS in online and blended learning environments. *TechTrends* **51**(2), 35–41 (2007)
4. Suleman, H.: Flipping a course on computer architecture. In: Gruner, S. (ed.) *SACLA 2016. CCIS*, vol. 642, pp. 83–94. Springer, Cham (2016). https://doi.org/10.1007/978-3-319-47680-3_8
5. Becker, W.E., Watts, M.: Chalk and talk: a national survey on teaching undergraduate economics. *Am. Econ. Rev.* **86**(2), 448–453 (1996). <http://www.jstor.org/stable/2118168>
6. Lage, M.J., Platt, G.J., Treglia, M.: Inverting the classroom: a gateway to creating an inclusive learning environment. *J. Econ. Educ.* **31**(1), 30–43 (2000). <https://doi.org/10.2307/1183338>