

Examination of the Impact of Learning Management System on University Undergraduate Students' Academic Performance

Michael Bamidele Ojo

Educational Foundations and Early Childhood Education Department
Faculty of Specialized and Professional Education, Emmanuel Alayande University of
Education, Oyo.

doi: <https://doi.org/10.37745/ijeld.2013/vol12n56782>

Published June 23, 2024

Citation: M.B. Ojo (2024) Examination of the Impact of Learning Management System on University Undergraduate Students' Academic Performance, *International Journal of Education, Learning and Development*, Vol. 12, No.5, pp.67-82

ABSTRACT: *The study examined the impact of Learning Management System (LMS) on university undergraduate student's academic performance. The study adopted quasi-experimental design, the data for the study were collected through the use of online questionnaire and students' academic achievement scores in Test and Measurement. The study sample comprised one hundred and four (104) university undergraduate students of Ajayi Crowther University Oyo. The result of the study revealed that there was positive relationship between the use of LMS and students' academic performance. The findings of the study also revealed that there was significant difference in academic performance of both male and female university undergraduate students taught with LMS and those that were taught with traditional method. The study further revealed that the usage of LMS is hindered with some factors among which are low levels of commitment of the lecturers to the use of LMS, lack of ICT based learning strategy as well as inability of lecturers to provide the needed technical support. The study equally revealed that effective usage of LMS can be recorded by organizing ICT training for both the lecturers and students and improvement of infrastructural facilities will go a long way in improving the effective usage of LMS for teaching and learning process. Based on the findings of the study, it was recommended that the use of LMS should be encouraged in Nigeria tertiary institutions, lecturers and students should be encouraged to improve their computer literacy skills for effective usage of LMS, government and curriculum development agencies should incorporate learning management system usage into tertiary institutions' curriculum as one of the modes of instructional delivery and that learning management system facilities should be adequately provided in Nigeria tertiary institutions.*

KEYWORDS: impact, learning management system, academic performance, university undergraduate students, test and measurement.

INTRODUCTION

Educational Institutions, especially the tertiary institutions are incorporating Information and Communication Technology (ICTs) into the teaching and learning in recent times. This has been improving students' academic performance, enhancing students learning and getting students to be active in the learning process (Mohammed, 2021), ICT has continued to be the major priorities in education in Nigeria and as education remains pivotal for the overwhelming development of the society, efforts were made by various educational institutions to ensure the continuity of teaching and learning without physical contact between teachers and learners, thereby leading to the adoption of e-learning strategies. E-learning involves a wide range of technology-based learning through website, learning portals, YouTube, mobile apps, video conferencing, learning management systems and many other free available technology for effective learning (Punie, 2007, Sezer &Yilmaz, 2019, Brown, 2020, and Bove & Conklin, 2020).

To use e-learning very well, it is better to control how the learners interact with the materials and the educators through the computer. This is made possible by using special type of information systems called E-learning Management System (ELMS) (Roschell, 2003). Learning Management System (LMS) has been referred to as 'learning platforms, distributed learning systems', 'course management system', 'content management', system 'portals' and instructional management system which combine a range of course or subject management and pedagogical tools to provide a means of designing, building and delivering online learning environment (Emelyano &Voronina, 2014 and Gambari, 2021).

A learning management system according to Brush (2019), is a software application or website based technology used to plan, implement and assess a specific learning process. According to Borboa, Joseph, Spake and Yazdanparast (2014) it is an online programme that serves as a learning and communication platform for students. Ojeda- Castro, Murray-Finley, Sanchez-Villafane (2007) posited that LMS could provide a variety of customized learning used to facilitate choice and control for the learners as they work towards mastery of required attainments and deep knowledge of all standard subject and skills in LMS. LMS is an e-learning base platform based on two major elements, a server that performs the base functionality and a user interface that is operated by an instructor, students and administrators (Ugwoke, Edeh &Ezemma, 2019). The LMS according to Yousef (2018) enables an instructor to create and deliver content, monitor students' participation and assess students' performance.

Ajjjola, Ogunlade, Aladesusi and Olumorin (2021) revealed that LMS provides an avenue for the delivery and tracking of e-learning initiatives in one place and that, it is a platform for digital learning with the following key characteristics.

- **Learning:** It allows for the management of both course and learners.
- **System:** It makes use of a computer system for learning management system.

According to Hill (2012), LMS is an online learning tool that connects teachers with students beyond the traditional classroom for effective learning activities. Teachers use the

LMS to achieve their stated instructional goals through several activities that happen in the classroom. According to Bhalalusesa, Lukwaro Clemence, (2013) online-learning is an essential medium which constitutes a critical factors in virtual learning. The main purpose behind its adoption is to replace face-to-face teaching and learning.

Learning Management System according to Zanjani, Nykvist and Shlomo (2013) addresses three major requirement. First, it is a completely reliable networking digital environment that includes interactive interface for both teachers and students, Secondly, LMS provides the content of the curriculum and assessment for teaching and learning in digital form. Third, an LMS includes special tools for managing classroom activity. They further stressed that LMS should be able to adhere to centralised and automated administration, use self-service and self-guided service, assemble and deliver learning initiatives on a web-based platform, support portability and standards personalize content and enable knowledge reuse (Al-Aonizi and Ally 2014).

The use of LMS is currently dominating the academic scene in higher educational institutions (Peria, Candolita, Mahinay, Campos & Buladiaco, 2021). To Oguguo, Nannim, Agah, Ugwuanyoi, Ene and Nzeadbe (2021), LMS is an instructional strategy that makes learning easier and faster when compared with traditional classroom learning, promote interactive and collaborative learning experiences, encourage one to learn at his/her own pace, enhance flexible learning system and give opportunities to learners to access the latest materials. O'Leary and Ramsden (2002) reported that the use of LMS by academic/instructor is premised on the way it is improving the learning experiences of students. They found a positive correlation between students' commitment to use of the LMS in learning and their academic performance. E-learning basics (2021), Fatmi ,Mohammed,Muliamah & Nasrah (2021), Ahmed and Mesonovich (2019) and Alshehri, Rutter and Smith (2020) revealed that LMS has positive impact on students' interaction, motivation, skills, performance and achievement.

To be able to fulfill its functions, LMS have communication and cooperation tools (announcement areas, e-mail, chat, list servers, instant messaging and discussion forums), content development and delivery tools (learning resources, development of learning objects repositories and links to internet resources management tools (registering, enrolling displaying timetables, managing students activities and electronic offices hours); and assessment tools (submission, multiple choice testing, collaborative work and feedback), (Coates, James & Badwin 2010). With the use of LMS in teaching and learning, students become responsible for their learning, they identify and interact with a variety of technologies to construct and discover their own knowledge. Other benefits that LMS offer in the classrooms are students centered, team centered collaborative learning and a high level of students-to-students interaction (Lim, 2021 and Kant, Prasad &Anjali, 2021).

As identified by Asiri, Ab-bakar & Mohb Ayub (2012) there are some variables that are associated with technology integration in instructional delivery among which are computer training, experience in computer usage, conference or workshop on ICT, and gender which are germane factors that determines the effective utilization of learning management system. Ally

(2013) identified significant gender differences on the influence of LMS usage on learning with female students having higher engagement in the usage of LMS Yousef (2018) also revealed significant influence of gender on students' engagement in the learning management system while Daniels (2009), Bryson & Jekins (2015) and Binyamin, Ruiter and Smith (2020) revealed a low significant difference in the influence of gender on the usage of LMS tools. The study revealed that female students are less influenced than their male counterparts when learning through the use of LMS. Lim, Nam, Eom, Kim & Kim (2020) on the other hand, found that both male and female students use LMS in accessing class-related information such as syllabus, instructors, attendance but noted that male students differed significantly in their use of LMS for learning.

However, scholars have identified some challenges that could limit the efficacy of the LMS in instructional delivery, Taufiqurrochman, Muslimin, Rofiki & Abah, 2019 and Sahu (2020) identified low quality of instruction when it involves the use on an LMS platform. Bates (2005) Whelan & Bhartu (2008) and Jo, LH, Yu, Lee, Kim (2015) revealed challenges such as poor internet facilitates and styles of teaching online. Selim (2007), Ojeda-and Castro, Murray-Finley & Sanchez-Villafane (2007) and Eliis (2009) poor competency of the lecturers and the students' problems of motivation, students' barriers to accessing the site and infrastructure reliability problems when the LMS is used. Becker (2000) identified barriers such as the students lack of knowledge of ICT, failure of the lecturers to provide the needed technical support, commitment of some lecturers to face-to-face teaching methods and their unwillingness to adopt ICT-based learning strategy or lack of training on the use of technology and poor commitment to a modern pedagogical approach that could inculcate the needed skills for online learning.

Statement of the Problem

The poor academic performance of students in tertiary institutions necessitated the adoption of different learning strategies that could maximise effective teaching and learning process and enhance good academic performance of students. Among the popular online learning strategies that are used in Nigeria tertiary institutions is the learning management system (LMS) for the delivery of instruction. Many researchers have revealed that an LMS can facilitate learning and proper interaction between the teachers and the learners while others are doubtful of the quality of instruction through the platform, coupled with a lack of proper training for both the teachers and learners on how to make use of the platform and benefits maximally, issues of infrastructural deficit and internet connectivity were also identified as the major factors that crippled the effective use of learning management system. However, since the adoption of an LMS can affect the academic performance of tertiary institution students, it is therefore necessary to find out the impact of the usage of LMS on the academic performance of University students in Test and Measurement and to find out the problems facing the usage of LMS in teaching and learning Test and Measurement and to suggest possible solutions to the usage of LMS in the teaching and learning process.

Purpose of the Study

The main purpose of the study is to find out the impact of Learning Management System (LMS) on university undergraduate student's academic performance in Test and Measurement when compared with face-to-face teaching and learning method.

The study will also find out the challenges facing the university undergraduate students in the use of Learning Management System during the teaching and learning

The study will look at the possible solutions to the challenges facing the users of LMS during teaching and learning as perceived by university undergraduate students.

The study will also investigate the difference in the mean scores of students taught with LMS and those taught without LMS

The study will investigate the difference in the mean scores of male and female students taught with the use of LMS

The study will equally find out the significant difference in the academic performance of university undergraduate students in Test and Measurement as a result of the usage of LMS and those that were taught with the use of face-to-face teaching method

Research Questions

The following research questions were answered in this study;

- i. What is the influence of Learning Management System on students' academic performance?
- ii. What are the challenges facing the users of learning management system in the teaching and learning?
- iii. What are the possible solutions to the challenges facing the users of learning management system in the teaching and learning?
- iv. Is there a difference in the mean scores of students taught using LMS and those taught without LMS
- v. Is there a difference in the mean scores of male and female students taught with the use of LMS

Hypothesis

H₀: There is no significant difference in the academic performance of university undergraduate students in Test and Measurement with the use of Learning Management System (LMS) and those that were taught without LMS

RESEARCH METHODOLOGY

The study employed quasi-experimental design to investigate the impact of LMS on university undergraduate students' academic performance in Test and Measurement using the students' academic achievement scores in Test and Measurement (SAASTM) and online questionnaire titled "Undergraduate Students Perception of the Influence of Learning Management System on Students' Academic Performance Questionnaire (USPILMSSAPQ) were used to collect data for the study. The questionnaire has four sections: sections A,B,C and D Section A contains the demographic data of the respondents, section B contains items on the influence of

LMS on university undergraduate students' academic performance placed on a four-point rating Likert scales of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD), section C consists of items on the challenges facing the users of LMS in the teaching and learning process which were measured on a four-likert rating scale of Strongly agree (SA), Agree (A), Disagree (D) and Strongly disagree (SD), section D consists of items on the possible solutions to the challenges facing the users of learning management system in the teaching and learning process which were also placed on four-Likert rating scale of Strongly agree (SA), Agree (A), Disagree (D) and Strongly disagree (SD),. The instruments were validated by expert in Education Technology and expert in educational evaluation respectively. The reliability coefficient of the instruments were found to be 0.79, 0.81 and 0.86 using test-retest reliability method.

Participants

One hundred and four (104) Ajayi Crowther University undergraduate students participated in this study. Informed consent was obtained from all individual participants in written forms. Though there were one hundred and nine students in the Department of Economics Education, but five of them did not took part in the study because they were not available at the commencement of the study.

METHOD OF DATA COLLECTION

For the purpose of the data collection for this research, the researcher divided the students into two groups (experimental and control). For the experimental group (52 students), the researcher used Learning Management System to teach them whereas, for the control group (52 students), their test and measurement teaching .was carried out without the use of LMS. Following the experiment, the researcher conducted test for both the experimental group and the control group. The researcher further administered online questionnaire to the university undergraduate students that passed through the Test and Measurement class with the use of learning management system and at the end, the responses of the one hundred and four university undergraduates and the responses of experimental group to the online questionnaire was used as the data in the study.

Data Analysis

Frequency Counts and Simple percentage was used to answer the research questions i-iii, mean, standard deviation and mean difference was used to analyse research questions iv and v in the study while t-test was used to test the research hypothesis at 0.05 level of significance using the SPSS 16 version

Research Question 1: What is the influence of Learning Management System on university undergraduate students' academic performance?

Table 1: The influence of LMS on university undergraduate student's academic performance.

S/N	ITEMS	RESPONSE							
		SA		A		D		SD	
		F	%	F	%	F	%	F	%
1.	LMS enables me to clearly understand course topics.	32	61.5	12	23.1	06	16.5	02	3.9
2.	LMS enables me to reflect on my knowledge gaps while preparing for the lesson.	34	65.4	10	19.2	06	11.5	02	3.9
3.	LMS enables me to clearly understand dates and time frames for learning activities.	30	57.6	18	34.6	02	3.9	02	3.9
4.	LMS enables me to understand important course objectives	42	80.7	06	11.5	02	3.9	02	3.9
5.	My test and measurement lecturer was able to use the LMS efficiently for teaching.	36	69.2	10	19.2	04	7.7	02	3.9
6.	I Learn better through LMS than through face-to-face lectures.	30	57.6	16	30.8	04	7.7	02	3.9
7.	Using LMS will enhance me better scores in Test and Measurement	34	65.5	06	11.5	06	11.5	06	11.5
8.	The use of LMS has increased my chance of getting better grades (CGPA)	32	61.6	10	19.2	06	11.5	04	7.7
9.	LMS is useful for my effective learning.	28	53.9	14	26.9	04	7.7	06	11.5
10.	LMS enables me to learn faster and better	40	76.9	06	11.5	04	7.7	02	3.9

The result in Table 1 show the perception of university undergraduate students on the influence of LMS on students' academic performance and it is clear that 84.6% of the students agreed that LMS enabled them to clearly understand course topics, while 15.4% disagreed. 84.6% of the respondents believed that LMS enabled them to reflect on their knowledge gaps while preparing for the lesson and only 15.4% of them hold contrary view, 92.2% of the undergraduate students believed that LMS enabled them to clearly understand dates and times frames for learning activities while 7.7 of them hold contrary view. Also 92.2% of the respondents agreed that LMS enabled them to understand the important course objective but only 7.7% were not. 88.4% of the students reported that their test and measurement lecturers were able to use the LMS effectively for teaching while only 11.6% do not believe that their lecturer were able to use LMS effectively for teaching. 88.4% of the undergraduate students believed that they learned better through LMS than through face-to-face lectures while only 11.6% of them disagreed. Furthermore 77% of the students agreed that using LMS will enhance those better scores in Test and Measurement while 23% of them disagreed. The respondents that believed that the use of LMS has increased their chances of getting better grade (CGPA) were 80.8% while 19.2% of them did not, 80.8% of the university undergraduate students hold the view that LMS is useful for their effective learning while only 19.2% hold a contrary opinion and 88.4% of university undergraduate students agreed that LMS enabled them to learn faster and better but only 11.6% disagreed.

Therefore, the result shows that Learning Management System has a greater influence on university students' academic performance in Test and Measurement

Research Question 2: What are the challenges facing the university undergraduate students in the usage of LMS in the learning of test and measurement?

Table 2: The analysis of the challenges facing students in the usage of LMS.

S/N	ITEMS	SA		A		D		F		SD	
		F	%	F	%	%		F		F	%
1.	There is low quality of instruction with the use of LMS.	08	15.4	04	7.7	10	19.2	30	57.7		
2.	Poor internet facilities is one of the problems of using LMS.	32	61.5	12	23.1	04	7.7	04	7.7		
3.	Students low knowledge of ICT affect the usage of LMS	28	53.8	18	34.6	04	7.7	02	3.9		
4.	Lecturer inability to provide the needed technical support is a problem of using LMS	26	50	16	30.8	06	11.5	04	7.7		
5.	Lecturers commitment to the use of face-to-face lecture method hinders effective usage of LMS	34	65.4	07	13.5	06	11.5	05	9.6		
6.	Lack of ICT training is one of the challenges of LMS usage	34	65.4	06	11.5	10	19.2	02	3.9		
7.	Unwillingness of lecturers to adopt ICT based learning strategy hinders effective usage of LMS	40	76.9	04	7.7	04	7.7	04	7.7		
8.	There is problem of adopting LMS to individual needs	08	15.4	04	7.7	28	53.8	12	23.1		
9.	The cost of accessing the learning management system is very high	42	80.7	04	7.7	04	7.7	02	3.9		
10.	Learning management system do contain irrelevant information which could distract users	37	71.1	09	17.3	02	3.9	04	7.7		

The result in table 2 show that 76.9% of the university undergraduate students disagreed that there is low quality of instruction with the use of LMS while 23.1% of them agreed. There was 84.6% of the respondents who agreed that Poor internet facilities is one of the problems of using LMS while 15.4% disagreed. 88.4.1% of the students agreed that low knowledge of ICT affect the usage of LMS while 11.6% disagreed. 80.8% of the students were of the opinion that lecturer's inability to provide the needed technical support is a problem of using LMS while 19.2% of them shared different opinion. 78.9% of the respondents agreed that Lecturers commitment to the use of face-to-face lecture method hinders effective usage of LMS while 21.1% of them disagreed, 76.9% of the university undergraduate students agreed with the statement that lack of ICT training is one of the challenges of LMS usage while 23.1% were of

different option. 84.6% of the students agreed that unwillingness of lecturers to adopt ICT-based learning strategy hinders effective usage of LMS while only 15.4% of them shared contrary view. 73.6% of the students disagreed that there is there is problem of adopting LMS to individual need but 23.9% of them agreed with the statement, 88.4% of the university undergraduate students agreed that the cost of accessing the LMS very high while 11.6% of the disagreed. Furthermore, 88.4% of the university undergraduate students hold the view that learning management system do contain irrelevant information which could distract users while 11.6% of them believed that LMS do contain irrelevant information which could distract users. Therefore, the result of this study reveals that there are a lot of challenges facing students in the usage of LMS which has continuously inhibiting the effective usage of LSM in the teaching and learning of Test and Measurement.

Research Question 3: What are the possible solutions to the challenges facing the users of learning management system in the sampled university?

S/N	ITEMS	SA		A		D		F		SD	
		F	%	F	%	%	F	F	%	F	%
1.	There should be regular power supply for the implementation of LMS	46	88.5	06	11.5	0	0	0	0	0	0
2.	Computer usage training should be organized for both the lecturers and the students	38	73.1	14	26.9	0	0	0	0	0	0
3.	Workshop on the use of LMS should be organised for both the students and the lecturers	42	80.8	10	19.2	0	0	0	0	0	0
4.	Lecturers/students should be motivated for the usage of LMS	39	75	09	17.3	01	1.9	03	5.8		
5.	Internet facilities should be provided for the usage of LMS	40	76.9	12	23.1	0	0	0	0	0	0

Table 3 shows that 100% of the university undergraduate students agreed that regular power supply for the implementation of LMS is one of the major possible solutions to the usage of LMS and that computer usage training should be organised for both the lecturers and the students. All the respondents also agreed that workshop on the use of LMS should be organised for both the lecturers and the students to overcome the challenges of LMS usage. 100% of the students hold the view that internet facility provision is one of the ways to overcome the use of LMS challenges. Also 92.3% of the respondents hold the view that if students and lecturers are motivated on the usage of LMS the challenges that LMS users are facing will be laid to rest while 7.7% of the respondents disagreed with the statement.

Therefore, regular supply of power, computer usage training/workshop on the use of LMS, motivation of lecturers and students on the usage of LMS and provision of internet facilities for the usage of LMS were identified as means of solving the challenges facing the users of LMS

Research Question 4: Is there a difference in the mean score of students taught with LMS and those taught without LMS.

Table 4: The difference in the Mean Score of university undergraduate students taught with LMS and those taught with face-to-face Classroom Method.

Variables	Number of Student's	Mean Score	Mean difference
Experimental (LMS)	52	11.32	1.88
Control (face-to-face teaching method)	52	9.44	

From table 4 the mean score of experimental group = 11.32 while the mean score of control group = 9.44 and the mean difference = 1.88. This implies that experimental group taught with the use of LMS performed better than the control group taught some concepts using the face-to-face classroom teaching method.

Research 5: Is there a difference in the mean score of male and female students taught with LMS

Table 5: The mean score of male and female university undergraduate students taught with LMS (experimental group).

Variables	Number of Samples	Mean Score	Mean difference
Female	26	11.92	1.19
Male	26	10.73	

From table 5, the mean score of the female students = 11.92 while the mean score of male students = 10.43 and mean difference = 1.19. This implies that the female taught with the use of LMS (Experimental group) performed better than the male students in the same group i.e. the result about shows that there is difference in the mean score of the female students taught with LMS and the male students in the same group.

Hypothesis

H₀₁: There is no significant difference in the academic performance of university undergraduate students in Test and Measurement taught with the use of Learning Management System and those that were taught without LMS

Table 6: Shows Significant difference in the academic performance of university undergraduate students in Test and Measurement with the use of Learning Management System and without the use of LMS

Variables	N	Mean	SD	SE	t-value	Df	P	Remark
Experimental	52	11.33	3.104	0.430	3.368	102	0.001	Significant
Control	52	9.44	2.578	0.357				

***Significant (p=0.05)**

From Table 6, it can be observed that at 0.05 level of significant $Df = 102$, the mean score of experimental group = 11.33 while the mean score of control group = 9.44. The P-value observed is = 0.001 since 0.001 is less than 0.05, this implies that there is a significant difference in the mean scores of the students taught with LMS and those taught without LMS. Therefore, the Null Hypothesis of this research is rejected as the results proves that there is a significant difference between the experiment and control group.

DISCUSSION OF FINDINGS

The findings of the study reveals that the usage of LMS could improve university undergraduate students' academic performance in test and measurement. This agrees with the position of Roschelle (2003) that with the help of the LMS, students' performance increase more than when face-to-face strategy of lesson delivery is used. The findings also is in agreement with the previous findings of Al-Aonizi and Ally (2014) Rep Ally (2013) and Bryson and Jenkins (2016) who reported that LMS have positive effects in student interaction motivation, skills perform and achievement. The findings of this study is also contrary to the finding of Alecu et al (2011), O'Leary and Ramsden (2002) Binti et al (2016), Oguguo et al (2021) and Muhammad (2021) on the capability of LMS use in promoting academic performance.

The study also reveals that the implementation of LMS as an instructional strategy is faced within a lot of challenges among which are internet facilities, how knowledge of ICT, lecturer in ability to provide the needed technical support, how level of commitment of the lecturers to the use of LMS, lack of ICT training unwillingness of lecturers to adopt ICT based learning strategy. This result is in agreement with the postulations of Olakunle and Bolaji (2017), Ajijola, Ogunlade, Aladesusi and Olumorin (2021) who revealed that effectiveness implementation of LMS in Nigeria tertiary institution is hindered with the problem of poor infrastructures, how level of ICT knowledge and poor commitment of lecturers to the use of LMS.

The findings of this study also revealed that the challenges of the implementation of LMS in tertiary institutions can be solved with the incorporation of effective computer based training,

organization of workshop on the use of LMS for the students and lecturers. This is in consonance with the views of JO, I.H, YU, TI, Lee, H. and Kim (2015) who recommended that there should be effective workshop and training on the use of LMS by both the lecturers and the students. The finding is also in line with the findings of Selim (2007) who suggested that internet usage training should be organized for both the students and lecturers for effective usage of LMS as learning strategy in Nigerian tertiary institution, it the findings is also in termed with the findings of Gambari (2021) and Coates, James and Baldwin (2005) who recommended that students and lecturers that are to be using LMS be motivated and encouraged so as to lay little emphasis on the usage of face-to-face teaching and learning strategy.

The study further reveals that there was no significant difference in the impact of learning management system on both male and female university undergraduate student's academic performance. This finding supports the report of Bates (2005) that male and female students' academic performance were influenced with the use of ICT in the teaching and learning the same way.

CONCLUSION

This study examined the influence of Learning Management System on the university undergraduate students' academic performance in Test and Measurement and the result showed that there is positive impact of LMS on university undergraduate students' academic performance. The study also identified the challenges facing the users of LMS and possible solutions were also identified. The findings equally revealed that there is a difference in the mean score of the students taught with LMS and those taught without LMS. The findings further shows that there was a different in the mean score of the female students with LMS and the male students in the same group. The result of the study also showed significant difference in the male and female university undergraduate students' academic performance in test and measurement with the use of learning management system and without the use of LMS because female undergraduate students performed better than their female counterparts

Recommendations

Based on the findings of this study, the following were recommended.

1. The use of Learning Management System should be encouraged in Nigerian tertiary institutions to aid effective teaching learning process.
2. Lecturers and students should be encouraged to improve their computer literacy skills to enhance effective use of Learning Management System.
3. Learning Management System facilities should be adequately provided in Nigeria tertiary institutions.
4. Government and curriculum development agencies should incorporate Learning Management System use in tertiary institutions' curriculum as one of the modes of instruction delivery.
5. The lecturers and students that are using Learning Management System should be motivated.

6. Female university undergraduate students should be encouraged to keep the fire burning as they are coming out of the African mentality that they are weak and unimportant in terms of contributing to the society educationally
7. Lecturers should be admonished to pay close attention on the male university undergraduate students to ensure that their participation in the class is improved because their performance is low when compared with their female counterparts

REFERENCES

- Ahmed, K., & Mesonovich, M. (2019). Learning management systems and student's performance. *International Journal of sustainable energy development (IJSED)*, 7, (1), 582-591.
- Ajjjola, E.M., Ogunlade, O.O. Aladesusi, G.A., & Olumorin, C.O. (2021). Perception of learning management system among distance learners in South-West, Nigeria *Journal of Digital learning & Education*, 1(2), 82-84. DOI:10.52562/JDLE.V1I2.214.
- Al-Aonizi, S., & Ally, M (2014). The use of e-learning in higher education (Dr. Saudsite model). Paper submitted at the Global Forum for Innovation in University Teaching, Imam Muhammad bin Saud. Islamic University. Riyadh, Saudi Arabia.
- Ally, M, (2013). Managing, designing and implementing 'blended learning' for flexible delivery. Workshop handout at the first International Conference in Open learning, Kuwait.
- Alshehri, A. Ruttere, M.J. & Smith, S. (2020). The effect of gender and age on students' use of learning management system in Saudi Arabia. *International Journal of learning and Teaching*, 6(2). 124-137 DOI:10181/IJLT.6.3135-145.
- Asiri, M.J. S., Abu Bakar, K. & Mohd Ayub, A.F. (2012). Factors influencing the use of learning management system in Saudi Arabian higher education: A theoretical framework. *Higher education studies*, 21, 124-134. DOI:10.5539/HES.V2N2P125.
- Bates, A.W. (2005). *Technology, e-learning and distance education* (2nd Ed.). New-York: Routledge Falmer.
- Becker, H.J. (2000). Findings from the teaching, learning and computing survey: is Larry Cuban right? (Electronic version). *Education Policy Analysis Archives*, 8, (51).
- Bhalalusesa, R., Lukwaro, E. E. A., & Clemence, M. (2013). Challenges of using E-learning Management Systems faced by the Academic Staff in Distance based Institution from Developing Countries: A case study of the Open University of Tanzania. *Journal of the Open University of Tanzania*, 14 (1). 45-51
- Binyamin, S.S., Rutter, M.J. & Smith, S. (2020). The moderating effect of gender and age of students acceptance of learning management system in Saudi Higher Education. *Knowledge management and E-learning*. 12{1}, 60-62.
- Borboa, D., Joseph, M., Spake, D., & Yazdanparast. A. (2014). Perception and use of LMS tool and other technologies in higher education: A preliminary analysis. *Journal of learning in Higher Education*, 10(2).17-23

- Bove L. A. & Conklin, S. (2020). Learning Strategy for Faculty During a Learning Management System Migration. https://www.westga.edu/-distance/ojdla/spring231/bove_conklin231.html
- Brown, D. (2020). The 13 must-have features of a learning management system. Retrieved from the <https://www.peoplefluent.com/blog/learning/13-must-have-features-of-a-learning-management-system>
- Bryson, J. & A. Jenkins A, (2015). Understanding and supporting ‘blended learning’ teaching practices, (Online) Available: www.edelements.com, (Accessed 02-Nov-2016).
- Coates, H., James, R., & Baldwin, G. (2005). A critical examination of the effects of learning management system on university teaching and learning. *Tertiary education and management*, 11, 19-36.
- Coates, H, James, R, & Baldwin, G (2010). A critical examination of the effects of learning management systems in university teaching and learning. *Tertiary education and management* 54(4), 1222-1223.
- Daniels, P. (2009), Course Management Systems and Implication for Practice. *International Journal of Emerging Technologies & Society*, 7(2), 97-108.
- E-learning Basics (2021). A learning management system (LMS): Everything there is to know Retrieved from <https://www.ispringsolutions.com/blog/what-is-ims>.
- Emelyano, N., & Voronina, E. (2014). Introducing a learning management system at a Russian University: Students’ and teachers’ perceptions. *The International Review of Research in Open and Distributed Learning*, 15(1), 17-22
- Ellis, R.K. (2009). A Field Guide to Learning Management Systems. *American Society for Training or Development (ASTD)*.
- Fatmi, N., Muhammad, I. Muliana, U., & Nasrah, S. (2021). The Utilization of Moodle-Based Learning Management System (LMS) in Learning Mathematics and Physics to Students’ Cognitive Learning Outcomes. *International Journal for Educational and Vocational Studies*, 3(2), 155-162, DOI: <https://doi.org/10.29103/ijevs.v3i2.4665>
- Gambari, A. I. (2021). Adopting 21st century global best practices through innovative technology integration in education. A Lead Paper Presented at the International Conference and Workshop on Innovation, Technology and Education Organization by AITIE, August, 9th 13th
- Hill, P. (2012), Online Educational delivery models: A descriptive view. *EDUCAUSE Review*. 47(6) 84-97 (Online) <http://www.educause.edu/ero/article/online-educational-delivery-modelsdescriptive-view>
- Jo, I.H., Yu, T., Lee, H., & Kim, Y. (2015). Relations between student online learning behavior and academic achievement in higher education: A learning analytics approach. In G. Chen V, Kumar, Kinsuk, R. Huang & S.C. Kong (Eds.), *Emerging issues in smart learning*, Springer Berlin Heidelberg, 275-287.
- Kant, N. Prasad, K. D & Anjali, K. (2021). Selecting an appropriate learning management system in open and distance learning: a strategic approach. *Asian Association of Open Universities Journal*, <https://doi10.1108/aaouj-092020-0075>

- Lim, K. Nam, Y. Eom, S., Kim, Y, & Kim M. (2020). Structural gender differences in LMS use patterns among college students' sustainability..12 4465:103390/su12114465.
- Mohammed, U.A. (2021). Effect of using learning management system on academic performance of students in financial accounting in secondary schools in Bauchi State. Retrieved from <https://www.grin.com/document/983916>.
- O'leary R., & Ramsden, A. (2002). Factors influencing the success of learning management system (LMS) on students' academic performance. *IYSIL*, 1(1), 36-49
- Oguguo, B.C.E., Nanim, F.A. Agah, J.J., Ugwuani, C.S., Ene, C.U. & Nzeadibe. A.C. (2021). Effect of learning management system on student's performance in educational measurement and evaluation. Retrieved from <https://link.springer.com/article/10.1007/s10639-020-10318>.
- Ojeda-Castro, A. M., Murray-Finley, P & Sanchez-Villafane, J. (2007). Learning Management System Use to Increase Mathematics Knowledge and Skills in Puerto Rico. *International Journal of Technology and Human Interaction*, 13(2), 29-36
- Olakunle, A.S. & Bolaji, H.O. (2017) Perception of undergraduates on the use of learning management system (LMS) for learning chemistry concepts. *International Journal of Innovative Technology Integration in Education*, 1(2), 31-38
- Peria, C.K.T., Candolita, M.V., Mahinay, J.A. Campos, E. & Buladaco, M.V.M. (2021). Impact of learning management system as a new platform of instruction towards learning satisfaction of BSED English students of Davao Del Norte State College, *International Journal of Research and Innovation in Social Science (IJRISS)*. 5(2), 77-88.
- Punie, Y. (2007). Learning Spaces: an ICT-enabled model of future learning in the knowledge-based Society. *European Journal of Education*, 42(2), 2, 185-199.
- Roschelle, J. (2003). Learning by collaborating: conceptual change. *The Journal of the Learning Science*, 2, 235-276.
- Sahu, P. (2020) Closure of University due to Coronavirus Diseases 2019. (COVID-19) Impact on Education and Mental Health of Students and academic staff. *Cureus* 10(12), e7541DOI 10.7759 Cureus 7541.
- Selim, H.M. (2007). Critical success factors for e-learning acceptance: Confirmatory factor model, *International Journal for Computer and Education*, 49(2) 396-413. Elsevier ltd. <http://dx.doi.org/10.1016/j.compedu.2005.09.004>.
- Sezer, B. & Yilmaz, R. (2019). Learning management system acceptance scale (LMSAS): A validity and reliability study. *Australasian Journal of Educational Technology*, 35(3). 15-30
- Taufiqurrochman, RT., Muslimin, I., Rofiki, I. & Abah, J. (2019). Students' Perceptions on Learning Management Systems of Arabic Learning through Blended Learning Model. *Journal Al Bayan: Journal Jurusan Pendidikan Bahasa Arab*, 12 (1): 22-36 <https://doi:1-.24042/albayan>.
- Ugwoke, E., Edeh, N. I. Ezeemma, J. C. (2019). Business Education Lecturers' Perception of Learning Management Systems for Effective Teaching and Learning Accounting in Universities in South-East, Nigeria. *Library Philosophy and Practice*, <http://digitalcommons.unl.edu/libphilprac/2122>

- Whelan, R. & Bhartu, D. (2008). Factors in the deployment of learning management system at the University of South Pacific. Paper presented at the proceeding ascilite Singapore 2007.
- Yousef, A. (2018). Effectiveness of students engagement using learning management system in the blended learning environment at Saudi Electronic University. Retrieved from <http://digscholarship.unco.edu/dissertations/484>.
- Zanjani, N; Nykvist, S.S, & Shlomo G. (2013). *Whatmakes an LMS effective: a synthesis of current literature*. Paper presented at the proceeding of CSEDU 2013-5th *International Conference Computer Supported Education*. 18-21