

Digital Literacy Skills and System Quality as Predictors of Learning Management Systems Use of Postgraduate Students in Ibadan Nigeria

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Abstract:

The use of learning management systems (LMS) was observed to be weak among students in Nigeria. Therefore, digital literacy skills and system quality were used as predictors to predict LMS use among postgraduate students in universities in Ibadan, Nigeria. A survey design of the correlational type was adopted. At the same time, the population of the study comprised all the 4,750 postgraduate students of two universities in Ibadan, Nigeria, and 328 postgraduate students were drawn using a multi-stage sampling technique. The instrument adopted for data collection was a questionnaire which had three sections. The questionnaire return rate was 316 copies, representing a 96.3% retrieval rate. Pearson's Product Moment Correlation Coefficient and multiple regression analysis were conducted to test the null hypotheses at a 0.05 significance level. A significant relationship between digital literacy skills and the use of learning management ($r = 0.319$; $p < 0.05$) was found, while a significant relationship between system quality and the use of learning management systems ($r = 0.501$; $p < 0.05$) was equally established. There is a significant relationship between digital literacy skills and LMS system quality ($r = 0.529$; $p < 0.05$). Furthermore, a joint influence of digital literacy skills and system quality on the use of learning management systems of postgraduate students in universities in Ibadan, Nigeria ($F = 53.594$; $R = 0.505$; $p < 0.05$) was established. It was recommended that university management and lecturers should ensure the system quality of the LMS type to be adopted must support the convenience of use and have fewer technicalities in its use.

Keywords: *Digital Literacy Skills, Postgraduate Students, System Quality, Use of Learning Management Systems.*

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Introduction

The term Information and Communication Technology (ICT) intervention as regards learning is evolving and as well improving the way instructions are passed in the classroom environment. It is also becoming a tool for facilitating lecturers' and learners' participation beyond face-to-face structure; which is bound by physical presence, limited spaces, note writing and fixed schedule and et cetera. ICT integration in teaching and learning is equally ensuring the conversion of lecture content into electronic documents, audio, video, audiovisual and others which are packaged as learning management systems(LMS). LMS flexibly supports the provision of education as learning activities are automated thereby, enhancing students' access to education from the comfort of their desired location without a barrier in terms of geographical distance and time. ICT is a means to ensure students' furtherance of their higher education in higher institutions of their choice with little or no physical participation.

According to Reid (2019), this transformational method of learning strengthens students' interest in taking up courses that build their level of professionalism and specialisation in a particular field of knowledge which is available in universities across the globe. As learning management systems are adopted by such institutions, they can enrol for their studies with minimal or no physical presence in the classroom. The same applies to postgraduate students.

Postgraduate study is not age-restricted as young and older graduates who intend to further their studies for a postgraduate degree can do so, once they have satisfied the requirements. Observations revealed that graduates mostly enrol for postgraduate studies to deepen their understanding of their profession, specialise in a particular field of the profession, satisfy job requirements, needed to get a promotion in their current job and position themselves for work opportunities in a new profession and much more. Postgraduates also involve certain academic activities postgraduate students must participate in before they graduate. Postgraduate students' academic activities involve receiving lectures, seminar presentations, research, submission of assignments, taking of tests, examinations, term paper presentations and so on. However, their job, family responsibilities and distance oftentimes could interfere with their active participation in such academic activities. According to Majumdar (2015), learners such as postgraduate students often desire comfortability in a period of learning, location, place, content selection and receiving of lectures. This has deepened their interest in taking courses as well as attending universities that automate their learning activities by adopting learning management systems.

Borstorff and Lowe (2007) as cited by Abdallah, Ahlan and Abdullah (2019), defined learning management systems as the possibility of allowing learners and lecturers at universities to achieve their learning goals simultaneously with catering to their personal needs as well as retaining their job, without any reason to partake in classroom activities and also be subjected to fixed schedules which could affect their personal or job goals. Learning management systems go beyond making information available on the Internet to further the organisation of learning content and give insight into teaching methodology that can be incorporated into the online learning environment. It is a non-conventional method to lecture delivery that supports students to learn at their convenience and still satisfy their course requirements. Learning management systems enable instructors and students can collaborate to create and deliver content, track student contributions, and evaluate student performance without regard to space or time constraints (Abdallah, Ahlan& Abdullah, 2019).

According to Raji, Okunlola and Abanikannda (2019), learning management systems refers to a web-based platform, which allows for conveying course curriculum, programme monitoring and reporting as well as for sharing course materials and hastening lecturers-students and students-students collaboration. This educational avenue has strengthened critical thinking and understanding of topics and the course as open discussions are maintained making it an ongoing class among students and lecturers without constraints of time and location. Lecturers and students can comment, and share learning content from anywhere and at any time on the portal. Through the availability of learning management systems, universities can strengthen their opportunities of providing higher education beyond the limit of their physical space.

Learning management systems have been adopted by universities to maintain their existence and support enrollment for courses offered beyond their location and physical structure. The lecturers can manage their course as lectures can be taken on the platform, course content presented in portable document format (Pdf), slides (PTT), audio, diagram/pictures, video, and weblinks are shared; evaluation activities such as quiz, test, assignment, exams are given and students participation through discussion, questioning are monitored. Learning management systems can exist as a website or mobile applications to support users' preferences and ease of accessibility and usability. Learning management systems organises learning involvement in such a manner that reminders and notification of the learning schedule are received before the lecture proper while it is also possible for presentation, examination and due date to be slated for assignment submission.

Ouadoud, Chkouri and Nejari (2018) posited that learning management systems represent all the services that support the managing of educational-related activities including interaction among the facilitator and learning participants including but not limited to access control services, real-time learning and offline tools of transmission and user administrative services. Learning management systems offer virtual learning which has made learning students centred and as such led to more uptakes of courses from their conveniences. It has provided equal access to learning content as materials uploaded can be accessed by every registered student and as such the materials are stored on the system to facilitate their download over time. This has reduced the cost of printing and eased access to learning content on the part of the students.

Learning management systems can manage the classroom as well as the course, as they can keep track of the learning participation of registered students undertaking a course on the portal and facilitate access to the required learning course outline and materials which are easily provided on the portal. Access to learning on the learning management systems is easy from anywhere and anytime through Internet-enabled devices. The features of learning management systems include group chats, discussion threads, video conferencing, lecture materials, assignments, tests, and exams, as well as learning modules, grading, and course evaluations, attendance, progress tracking, and collectively may be customised associatively with the mode of learning (Walker et al., 2016). This has encouraged innovative content to be packaged using multimedia formats such as text, audio, image, video, and ways of presenting lecture content to students which promotes quality of teaching and aids easy understanding and remembrance of topics and concepts.

LMS is centred on facilitating learning online and can support various forms of its uses, as it can serve as a portal for coordinating fully online courses, likewise different hybrid forms, such as blended learning and flipped classrooms, and distance education (Chigozie-Okwum, Ezeanyejí and Odii, 2018). The reason for the adoption of LMS for teaching and learning is not only on promoting education performance and productivity but likewise to provide an alternative means of instruction delivery and participation in learning activities (Siang and Santoso, 2015). Learning management systems are categorized basically into two platforms which are the open or free source and commercial LMS. Open or free sources are LMS which do not require any cost to ensure their use for learning activities while commercial LMS require a fee to be paid before they can be adopted for use. Different types of LMS have been developed which include Moodle, Blackboard, Google Classroom, Sakai, Schoology, Edmodo, Canvas, Desire2Learn, WebCT, Course Work, KEWL, Segue, Interact and Several others.

Learning management systems features help to provide support for effective teaching and learning experience but Al-Sharban, Al-Hunalyyan, and Alhajri (2020) stressed that users of LMS including postgraduate students often do not make use of the more advanced features of LMS which could limit their effective learning experience online. This could be due to their level of digital literacy skills and the system quality of LMS.

Kaeophanuck, Na-Songkhla, and Nilsook (2018) posited that digital literacy skills refer to competencies which are germane to effectively knowing as well as making use of different software applications and digital tools which can include learning management systems expediently. This would help individuals such as postgraduate students to achieve academic and life goals through LMS, managing and providing solutions through information and communication technology devices, communication skills, handling personal details on the Internet and likewise technological-based devices. further, posited that for university students, possessing digital literacy skills is of great necessity and is essential for learning in the digital age. Digital literacy skills are much needed as learning in the 21st century can occur through the digitalisation of academic activities like electronic submission of assignments, asking of questions, writing research papers, taking of tests, quizzes, and examinations and such skills are needed to facilitate ease of use of LMS platform as well as meet the academic expectations in such digital environment. Digital literacy skills can assist students in efficiently and effectively participating in learning and gaining optimally as they can explore the learning platform adequately. Digital literacy skills consist of a whole lot of skills that are required of a learner to participate, contribute, promote and achieve tangible results in the digital learning environment.

In their highlight of why digital literacy skills are very important to university students, it was clarified that digital literacy skills refer to competencies which are germane to effectively knowing as well as making do with different software applications and digital tools which can include learning management systems expediently to achieve academic and life goals, managing and providing solutions through information and communication technology devices, communication skills, handle personal details on the Internet and likewise the technologically based digital technologies. Possessing digital literacy skills is often regarded as being able to use technology expediently. Ability to type in the appropriate questions on the search bar of a search engine which could generate answers in text, pictures and videos needed to solve the problems and an understanding of the use of, and the procedure for periodic updating of antivirus software to prevent spam and viruses, is also embedded in digital literacy learning (Ng, 2012).

There could be a positive relationship between digital literacy skills and the use of learning management systems by postgraduate students. This is because if a postgraduate student possesses digital literacy skills it could enable him/her to explore the embedded features of the learning management systems effectively while participating in learning activities. It could also enable him/her to quickly, easily and confidently engage learning management systems for their learning tasks like submission of assignments, taking tests or examinations etcetera. This assumption is in agreement with the findings of Nikou and Aavakare (2021) that did a study including college students and faculty to assess how literacy and digital technology interact in higher education. To test the theory, it was proposed that someone with a high level of digital literacy skills might anticipate exerting less effort while using digital technology for teaching and learning activities and might anticipate experiencing more ease in using technology overall. System quality is therefore the second aspect that may have an impact on postgraduate students' adoption of learning management systems.

The term system quality is generally opined to be the quality regarding the performance or functional ability of a system such as learning management systems which is mostly based on students' perception while engaging it to use for online learning. System quality can be regarded as the quality of information processing itself, which is characterised by the use of highly developed technology, a typical system that has essential features and functions to support information procession, with software that is user-friendly, easy to learn, and easily maintainable (Al-Mamary, Alina, Aziati, 2014).

The quality of a system influences its acceptance and use of it within an organisation as the performance of the information system used directly relates to the organization's efficiency and effectiveness. The use of learning management systems by university students in Tehran, Iran, was examined by Mohammadi (2015), who found that user happiness and system quality are important drivers of both users' intentions to use LMSs and their actual use. An effective learning management system used by a university may have positive effects on the institution. Ifinedo (2011) cited by Shahzad, Hassan, Aremu, Hussain and Lodhi (2020) stated the impact of system quality on the learning management systems portal is that system quality of the learning management systems easily brings out query results more speedily. Additionally, the effectiveness of the system could boost kids' interest. The level of customer satisfaction is also increased by a user-friendly interface and a contemporary graphical interface. System quality based on learning management systems for the educational processes can be measured in terms of system accessibility, system interactivity, system flexibility, system reliability, system response, ease of use and user interface design.

It is assumed that there is a positive relationship between system quality and the use of learning management systems. This is because if the system quality of the LMS in use supports its ease of use, increased functionality, and good response time, then the postgraduate students might be encouraged to use and have a sustained intention to continually use the LMS. This supposition is supported by Yakubu, Dasuki, Abubakar, and Mah's (2020) research on the factors influencing the adoption of learning management systems in Nigeria: a hybrid SEM and artificial neural network method. The study was conducted using 738 respondents, consisting of postgraduate students and undergraduate students in private and public universities in the Northern part of Nigeria. The findings of the study revealed that system quality has a positive and significant influence on students' behavioural intention to use LMS. The system quality measures the LMS's usefulness, dependability, and efficiency. As a result, students credit their use of the LMS to these characteristics. Students would be less likely to use the LMS if it was unreliable, nonfunctional, or inefficient because it would require a lot of work to use. Good system quality will enable students to have a sustained interest in the use of LMS at all times. The foregoing indicates the need to empirically establish the relationship among these variables and the predictive powers of the independent variables to the dependent variable, particularly among postgraduate students in Ibadan, Oyo State, Nigeria. Ibadan has the premier university in Nigeria and the university has one of the best and strongest postgraduate colleges in Nigeria for this singular reason, the study focuses on it with consideration of another university situated in Ibadan to expand the scope of the study beyond one university. The study is unique to postgraduate students in Ibadan as such study has not been carried out using Ibadan hitherto to this study, therefore, bridging both the literature and scope gap identified in the literature. It is on this premise that this study will investigate the digital literacy skills and system quality in the use of learning management systems by postgraduate students in two universities in Ibadan, Nigeria.

Statement of Hypothesis

The following null hypotheses will be tested in the study at a 0.05 level of significance:

HO₁: There is no significant relationship between digital literacy skills and the use of learning management systems by postgraduate students in two universities in Oyo State, Nigeria.

HO₂: There is no significant relationship between system quality and the use of learning management systems by postgraduate students in two universities in Oyo State, Nigeria.

HO₃: There is no significant relationship between digital literacy skills and LMS system quality among postgraduate students in two universities in Oyo State, Nigeria.

HO₄: There is no joint influence of digital literacy skills and system quality on the use of learning management systems by postgraduate students in two universities in Oyo State, Nigeria.

Related Work

Pretorius and Biljon (2010) conducted a study to determine the effects of information and communications technology (ICT) skills, usability, and learnability concerning learning management systems by taking into account the experience of ICT experts and non-experts in the use of LMS for educational activities at an open-distance university. Task-based usability testing, eye tracking, post-test surveys, and interviews make up the study's research design. A written assignment was required of the participants in DOC format (Word document) and a PDF file, and resubmit the assignment in a different format from the initial. It was conclusively reported that ICT skills greatly affect the usability of LMS to the point that a deficiency of ICT skills among the students can hinder them from using the LMS. This also supports the earlier research findings of Van Biljon and Pretorius (2009) that ICT skills have a critical implication for the use of LMS.

In a study conducted by Wolverton, Hollier, and Lanier (2020) at a public institution in the Southeast of United States, the authors looked at the effect of computer self-efficacy on student engagement and group satisfaction in online business courses. The study had 83 student participants, and structural equation modelling was used to analyze the data. According to the investigation's findings, computer self-efficacy (CSE) increases student participation in online learning activities such as using learning management systems (0.350, $t=3.785$, $p 0.001$). This implies that the ability of the students to recognise that he or they possess computer skills will drive their engagement to use the learning management systems for their educational activities. The outcome of the study buttressed the student conviction of being able to competently use the computer will make them increase their interest in taking up courses that are facilitated through the learning management systems platform.

Yakubu et al (2020) investigate the factors contributing to students' acceptance of learning management systems at four (4) universities in Nigeria among 1116 students. It was hypothesised that the effectiveness of the system will have a favourable or significant impact on users' behaviour and intention to utilize the LMS. In the study, students'

behavioural intent to use learning management systems also serves as a predictor of such usage. The study's findings showed that students' behavioural intention to utilize learning management systems is significantly and positively influenced by the system's quality. Students would be less likely to use the LMS if it were unreliable, nonfunctional, or inefficient because it would take a lot of work to use it. This backs with the conclusions of Ramayah et al. (2010), who believed that a solid system is essential for keeping learning management system use going strong.

A study carried out by Tella and Mutula (2010) investigates a suggested framework for measuring the effectiveness of the WebCT system for managing course content. The success of the WebCT course content management system at the University of Botswana was investigated using the information system success model (ISSM). Students and university professors who use the course content management system make up the study's participants. To analyse the data, descriptive statistics were used. The idea was that factors like system quality would not have a substantial impact on how successful a course content management system would be. The study's conclusions showed that there is a correlation between system quality and utilization of the WebCT course content management system, indicating that the null hypothesis is not accepted. This implies that system quality is very key to the use of learning management systems and possession of digital literacy skills will help the students to customize the system to their desire. Similarly, the findings of this present study agree with Binyamin, Rutter and Smith's (2018) submission that there is a significant relationship between Computer Self Efficacy (CSE) and Perceived Ease of use (PEOU) of the system as PEOU is directly affected by CSE. This explains that students that have high computer self-efficacy are at a better chance of perceiving that LMS will be easy to use. In addition, this finding corroborates with the findings of Abdullah and Ward (2016), whose study result indicated that computer self-efficacy is the strongest determinant of perceived ease of use of learning management systems. Their perception of the system's ease of use invariably promotes their maximization of the LMS features

Pretorious and Biljon (2010) carried out a study to find out by taking into account the experiences of information and communications technology (ICT) specialists and non-experts in the use of LMS for educational activities at an open-distance university, the implications of ICT Skills, usability, and learnability concerning learning management systems. Task-based usability testing, eye tracking, post-test surveys, and interviews make up the study's research design. A written assignment in DOC (Word document) and PDF file formats, as well as a second submission of the assignment in a different format, were required of the participants. It was conclusively reported that ICT skills greatly affect the usability of LMS to the point that a deficiency of ICT skills among the students can hinder them from using the LMS. This suggests that the possession of ICT skills and the ability of a system to be used to perform certain activities will help to determine the use of learning management systems to facilitate learning by the students.

Research Method

The research design adopted for this study was a descriptive survey design of the correlational type (Kumar, 2018). The population of the study was all 4,750 postgraduate students of two universities in Ibadan, Nigeria. The universities are the University of Ibadan, and Lead City University, Ibadan, Nigeria out of which three hundred and twenty-eight (328) postgraduate students were drawn using a multi-stage sampling technique. The instrument used for the data collection was a structured questionnaire with three sections namely 1) use of learning management systems with sixty-three (63) items to determine the dependent variable (DV) 2) Digital Literacy Skills of postgraduate students with forty-two items to determine the independent variable (IV) and 3) System Quality of LMS with thirty-seven (37) items to determine the second independent variable (IV). The questionnaire was face and content validated by two experts in the field of information studies all from the University of Ibadan. The reliability of the questionnaire was determined using Cronbach alpha statistics with the average index of the use of learning management systems as 0.88 while that of digital literacy skills is 0.94, as well as the system quality of LMS, is 0.94 which implied the instruments were reliable. Out of the 328 copies of the questionnaire administered by the researchers, 316 copies, which represents 96.3% of the sample were retrieved which was considered adequate for the study. Hypotheses were tested at a 0.05 level of significance with Pearson's Product Moment Correlation (PPMC).

Result and Analysis

H1: There is no significant relationship between digital literacy skills and the use of learning management systems by postgraduates in two universities in Ibadan, Nigeria

Table 1 shows the relationship between digital literacy skills and the use of learning management systems for postgraduate students in universities in Ibadan, Nigeria. The table1 showed that digital literacy skills ($r = .319$; $p < 0.05$) have a significant positive relationship with the use of learning management systems of postgraduate students in universities in Ibadan, Nigeria. This implies that there is a positive linear association between digital literacy skills

and the use of learning management systems by postgraduate students in universities such that the more skilful the students are concerning digital literacy, the higher the likelihood of improvement in their use of learning management systems. As a result, the null hypothesis, which states that there is no connection between digital literacy skills and the usage of learning management systems by postgraduate students at two universities in Ibadan, Nigeria, is rejected.

Table 1. Relationship between digital literacy skills and the use of learning management systems of postgraduate students.

Variables	N	Mean	St.Dev	Df	R	P	Sig
H₁ Use of learning management systems	316	128.05	22.37	315	.319	.000	Sig
Digital literacy skills	316	141.54	15.77				
H₂ Use of learning management systems	316	128.05	22.37	315	.501	.000	Sig
LMS system quality	316	116.54	16.41				
H₃ Digital literacy skills	316	141.53	15.77	315	.529	.000	Sig
LMS system quality	316	116.54	16.41				

Note: hypothesis is tested at 0.05 significant level

H₂: There is no significant relationship between system quality and the use of learning management systems by postgraduates in two universities in Ibadan, Nigeria

Table 1 also shows the relationship between system quality and the use of learning management systems by postgraduate students in universities in Ibadan, Nigeria. Table 4.2 showed that system quality ($r = .501$; $p < 0.05$) has a significant positive relationship with the use of learning management systems by postgraduate students in universities. This implies that there is a positive linear association between system quality and the use of learning management systems such that the more improved the quality of the learning management systems the better the student participation in LMS use for educational purposes. As a result, the null hypothesis, which states that there is no connection between system quality and postgraduate students' usage of learning management systems at two universities in Ibadan, Nigeria, is rejected.

H₃: There is no significant relationship between digital literacy skills and LMS system quality by postgraduates in two universities in Ibadan, Nigeria

Furthermore, Table 1 shows the relationship between digital literacy skills and LMS system quality. Table 1 showed that digital literacy skills ($r = .529$; $p < 0.05$) have a significant positive relationship with LMS system quality. This implies that there is a positive linear association between digital literacy skills and the LMS system quality such that the more skilful the students are concerning digital literacy, the higher the likelihood of improvement of their perception of LMS system quality. Thus, the null hypothesis stating that there is no significant relationship between digital literacy skills and LMS system quality by postgraduate students in two universities in Ibadan, Nigeria is hereby rejected.

H₄: There is no significant joint influence of digital literacy skills and system quality on the use of learning management systems by postgraduate students in two universities in Ibadan, Nigeria.

Table 2 showed that there was a significant joint influence of the independent variables comprising digital literacy skills and system quality on the dependent variable (use of learning management systems by postgraduate students in universities in Ibadan, Nigeria). Table 2 also showed a coefficient of multiple correlations (R) of 0.505 and a multiple-adjusted R square of .250. This suggests that the independent factors, when combined, account for the 25.0% variance in the use of learning management systems among postgraduate students at

universities in Ibadan, Nigeria. The F- ratio at the degree of freedom (df- 2/315) was used to determine the importance of the composite contribution at p 0.05. The table also demonstrated that the regression's analysis of variance produced an F-ratio of 53.594. This suggests that the ANOVA result mentioned above is significant at the 0.05 level. In light of this, the null hypothesis, according to which there is no substantial combined effect of system quality and digital literacy skills on postgraduate students' usage of learning management systems at two universities in Ibadan, Nigeria, is now rejected.

Table 2. Summary of regression analysis of the joint influence of digital literacy skills and system quality on the use of learning management systems by postgraduate students in universities

R	R Square	Adjusted R Square	Std. Error of the Estimate			
.505 ^a	.225	.250	19.27002			
SUMMARY REGRESSION ANOVA						
	Sum of Squares	Df	Mean Square	F	P	Remark
Regression	40216.321	2	20108.161	53.594	.000 ^b	Sig.
Residual	117436.868	313	375.198			
Total	157653.190	315				

Note: hypothesis is tested at 0.05 significant level

Results and Discussion

Relationship between digital literacy skills and use of learning management systems by postgraduates in universities in Ibadan

Findings from this study show that there is a significant positive relationship between digital literacy skills and the use of learning management systems. This implies that the more skilful the students are concerning digital literacy, the higher the likelihood of improving their use of learning management systems. This finding corroborates the findings of Pretorius and Biljon (2010), that carried out a study to find out the implications of ICT Skills, usability and learnability concerning learning management systems. The research design adopted for the study is task-based usability testing accompanied by eye tracking, post-test questionnaires and interviews. Participants were asked to submit a written assignment in DOC format (Word document) and a PDF file and resubmit the assignment in a different format from the initial. It was conclusively reported that ICT skills greatly affect the usability of LMS to the point that a deficiency of ICT skills among the students can hinder them from using the LMS. This also supports the earlier research findings of Van Biljon and Pretorius (2009) that ICT skills have a critical implication for the use of LMS.

Similar to this study, Wolverton, Hollier, and Lanier (2020) at a public institution in the southeast of the United States looked at the effects of computer self-efficacy on student engagement and group satisfaction in online business courses. The study had 83 student participants, and structural equation modelling was used to analyze the data. The investigation's findings showed that student participation in online learning, including the use of learning management systems, is influenced by their level of computer self-efficacy (CSE). This implies that the ability of the students to recognise that he or they possess computer skills will drive their engagement to use the learning management systems for their educational activities. The outcome of the study buttressed that students' conviction of being able to competently use the computer will make them increase their interest in taking up courses that are facilitated through the learning management systems platform.

Relationship between system quality and use of learning management systems by postgraduates in universities in Ibadan

Findings from this study further reveal that system quality has a positive relationship with the use of learning management systems. This implies that the more skilful the students are concerning digital literacy, the higher the

likelihood of improving their use of learning management systems. This implies that the more improved the quality of the learning management systems the better the student participation in LMS use for educational purposes. In support of the findings, Yakubu et al (2020) investigate the factors contributing to students' acceptance of learning management systems at four (4) universities in Nigeria among 1116 students. It was hypothesised that the effectiveness of the system will have a favourable or significant impact on users' behaviour and intention to utilize the LMS. In the study, students' behavioural intent to use learning management systems also serves as a predictor of such usage. The study's findings showed that students' behavioural intention to utilize learning management systems is significantly and positively influenced by the system's quality. Students would be less likely to use the LMS since it would take a lot of work to use it if it were unreliable, non-functional, or inefficient. This backs with the conclusions of Ramayah et al. (2010), who believed that a solid system is essential for keeping learning management system use going strong.

In further support of the findings obtained in this study, Chaw and Tang (2018) conducted research on what makes learning management systems effective for learning under a blended learning environment at a university and responses from 123 students were analysed using WarpPLS and SPSS. It was revealed that system quality had a statistically positive significant relationship with the use of a system (LMS).

Relationship between digital literacy skills and LMS system quality by postgraduate in universities in Ibadan.

Findings from this study show that there is a significant positive relationship exists between digital literacy skills and LMS system quality by postgraduate in universities in Ibadan. This implies that the more skilful the students are concerning digital literacy, the higher the likelihood of improvement of their perception of LMS system quality. The findings corroborate the findings of Tella and Mutula (2010) who investigate a suggested framework for measuring the effectiveness of the WebCT system for managing course content. The success of the WebCT course content management system at the University of Botswana was investigated using the information system success model (ISSM). Students and university professors who use the course content management system make up the study's participants. To analyse the data, descriptive statistics were used. The idea was that factors like system quality would not have a substantial impact on how successful a course content management system would be. The study's conclusions showed that there is a correlation between system quality and utilization of the WebCT course content management system, indicating that the null hypothesis is not accepted. This implies that system quality is very key to the use of learning management systems and possession of digital literacy skills will help the students to customize the system to their desire. Similarly, the findings of this present study agree with Rutter and Smith's (2018) submission that there is a significant relationship between Computer Self Efficacy (CSE) and Perceived Ease of use (PEOU) of the system as PEOU is directly affected by CSE. This explains that students that have high computer self-efficacy are at a better chance of perceiving that LMS will be easy to use. In addition, this finding corroborates with the findings of Abdullah and Ward (2016), whose study result indicated that computer self-efficacy is the strongest determinant of perceived ease of use of learning management systems. Their perception of the system's ease of use invariably promotes their maximization of the LMS features.

The joint influence of digital literacy skills and system quality on the use of learning management systems by postgraduate students in universities

The study's findings also showed a strong combined link between the independent factors (digital literacy skills and system quality) and the dependent variable (usage of LMSs by postgraduate students in universities in Ibadan, Nigeria). Pretorius and Biljon (2010) conducted a study to determine the implications of ICT skills, usability, and learnability regarding learning management systems by taking into account the experience of ICT experts and non-experts in the use of LMS for educational activities at an open-distance university. Their findings support the findings of this study. Task-based usability testing, eye tracking, post-test surveys, and interviews make up the study's research design. Participants were asked to submit a written assignment in DOC format (Word document) and a PDF file and resubmit the assignment in a different format from the initial. It was conclusively reported that ICT skills greatly affect the usability of LMS to the point that a deficiency of ICT skills among the students can hinder them from using the LMS. This suggests that the possession of ICT skills and the ability of a system to be used to perform certain activities will help to determine the use of learning management systems to facilitate learning by the students.

Conclusion

Using the research's findings as a foundation, the following conclusions were drawn: Digital literacy skills and the usage of learning management systems by postgraduate students at universities in Ibadan, Nigeria, have a favourable and substantial association. In universities in Ibadan, Nigeria, postgraduate students used learning management systems in a way that was positively correlated with system quality. Digital literacy skills and LMS system quality by postgraduate students in universities in Ibadan, Nigeria, have a substantial relationship. Digital literacy skills and LMS system quality had a sizable joint positive effect on postgraduate students' utilization of learning management systems in universities in Ibadan, Nigeria.

Recommendation

In line with the recommendations of the study, the following recommendations were proffered:

1. Students such as postgraduate students should be exposed to pieces of training that can aid the user of information and Communication Technology (ICT) devices which can improve their digital literacy skills. It will improve the learning experience of the students
2. University management and lecturers should ensure the system quality of the LMS type to be adopted must support the convenience of use and have fewer technicalities in its use by students, especially postgraduate students.

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