Assessment of the Extent of Implementation and Impact of Learning Management Systems (LMS) on Students' Academic Performance in International Private Secondary Schools in Abuja, Nigeria.

Friday Oko ORJI, Ph.D, *fmimps, f3mtt*
Founder, EduNova Digest Services and Chairman, Research and Curriculum Development,
Micro, Small and Medium Enterprise Institute of Management and
Professional Studies (MIMPS), Nigeria.
Correspondence email: orjifridayoko@gmail.com
ORCID ID: 0000000313663455

Augustina Ngozi AJAEGBO, Ph.D, *fmimps*
Department of Educational Foundations and Administration,
Nwafor Orizu College of Education, Nsugbe, Nigeria.

Nneka G. NWAKA, Ph.D, *fipmd*
Department of Educational Foundations and Administration,
Nwafor Orizu College of Education, Nsugbe, Nigeria.

Joseph Afamuefuna NWOSU
Department of Science, School of Education,
University of Nottingham, United Kingdom.

Samuel Ankomah AGYEI
Department of Science, School of Education,
University of Nottingham, United Kingdom.
DOI: 10.56201/wjimt.v9.no6.2025.pg1.13

Abstract
In the digital age, educational institutions increasingly rely on technology to enhance teaching and learning processes. Learning Management Systems (LMS) have emerged as essential tools for delivering instructional content, promoting student engagement, and improving academic performance. In international private secondary schools, particularly in urban centers like Abuja, Nigeria, LMS adoption has become more prominent. With the increasing integration of digital technologies in education, LMS platforms, such as: Moodle, Google Classroom, and Canvas have become central to instructional delivery and learning engagement. Based on the foregoing, the study assesses the extent of implementation and impact of LMS on students' academic performance in selected international private secondary schools in Abuja, Nigeria. The study answered three research questions, and descriptive survey research design provided the foundational blueprint for the study. A sample size of 375 respondents was drawn through a multi-stage sampling technique. This was composed of 60 teachers, 15 ICT personnel, and 300 students. The researchers' developed instrument, 'Implementation, Challenges and Impact of Learning Management Systems on Students' Academic Performance Questionnaire (ICILMSSAPQ), was used to collect data, after its validation by three experts. Cronbach alpha

method was adopted in testing the instrument for internal consistency, and a reliability coefficient of 0.78 confirmed the instrument as satisfactory. The researchers, together with five research assistants, used both direct and online administration strategies to collect relevant data. Descriptive statistical tools, basically mean and frequency tables were adopted for the data analysis. Findings revealed that on average, LMS are moderately implemented in international private secondary schools in Abuja, with varying degrees of utilization. It also revealed that, to a high extent, LMS enhances access and flexibility of learning, students' engagement with learning, and academic grades, notwithstanding obvious challenges, such as inconsistent internet access, limited digital skills, and underutilization of interactive features. The study concluded that while LMS have the potential to improve academic outcomes, their effectiveness depends on comprehensive integration strategies, including training, infrastructure support, and institutional policies. It was recommended that every supportive mechanism needed to maximize the potential of LMS, such as capacity and digital infrastructure, should be functionally made available.

Keywords: *Assessment, Implementation, Impact, Learning Management Systems, Academic Performance, International Private Secondary Schools.*

Introduction

In today's digitally driven world, the education sector has witnessed a profound transformation owing to the integration of technology in teaching and learning processes. In recent years, particularly during the COVID-19 pandemic, there was a general need to find possible platforms that could keep the education enterprise operational, and relevant stakeholders realized that online learning platforms offer the best alternative. Okoye and Bello (2021) asserted that undoubtedly, one of the most significant and innovative of such online options was found to be the Learning Management System (LMS), which serves as a backbone for delivering online education and supporting hybrid learning models. Akinola and Adebayo (2023) observed that LMS tools are increasingly being adopted in educational institutions worldwide to improve instructional delivery, enhance learner engagement, and facilitate continuous assessment. Understandably, in Nigeria, this shift is particularly observable in private and international schools that possess the requisite resources for technological innovation. This study is situated within this critical discourse, to uncover the effectiveness of LMS adoption in an elite educational context and to assess whether the anticipated academic benefits are being realized.

A learning management system is a digital platform designed to facilitate the delivery, tracking, and management of educational content. Exemplifying this, Al-Fraihat, et al. (2020) indicated that LMS platforms, such as: Moodle, Google Classroom, Canvas, and Blackboard, have become integral to contemporary pedagogy, allowing for streamlined content distribution, communication, assessment, and learner tracking. The platforms are perceived to offer support for synchronous and asynchronous learning environments, with obvious flexibility and personalized learning pathways. The platforms are believed to be particularly useful in implementing flipped classroom models, blended learning, and distance education. Contributing to the foregoing, Dhawan (2020) argued that the success of an LMS implementation, depends on factors such as institutional readiness, digital literacy of users, internet connectivity, and pedagogical alignment with. Understandably, in Nigeria, the use of LMS has seen growth primarily in higher institutions and elite private schools. Yet, questions remain about its efficacy in improving educational outcomes at the secondary school level.

Academic performance has to do with the extent to which a student has achieved their short or long-term educational goals, usually assessed through grades, standardized test scores, and other forms of academic evaluation. Nwankwo and Okwudishu (2020) sees it as a key indicator of student learning and school effectiveness, and González and Paoloni (2015) depend on quality of instruction, socio-economic background, access to resources, learning environment, and increasingly, the role of technology. Meanwhile, with the evolution of educational practices, LMS tools might have emerged as potential enhancers of academic outcomes by providing students with increased access to learning materials, self-paced instruction, timely feedback, and collaboration tools. However, Dhawan (2020) argued that it is also recognized that technology alone cannot improve academic performance unless accompanied by pedagogically sound practices and active engagement from both teachers and students in well-meaning schools.

International private secondary schools in Abuja cater to a demographic that includes expatriates, diplomatic families, and affluent Nigerians. These schools often follow international curricula such as the British IGCSE, American High School Diploma, or the International Baccalaureate (IB). They are typically better funded and equipped with modern facilities, including digital infrastructure (Okoh, 2019). Consequently, these schools are more likely to adopt LMS platforms and digital learning tools comprehensively. Despite these advantages, such schools are not immune to challenges such as varied digital literacy among students, resistance to change from educators, and the need to align international curricular standards with local educational objectives. These factors create a complex environment in which the true impact of LMS on academic performance must be carefully analyzed.

Numerous empirical studies have attempted to investigate the impact of LMS on student learning outcomes, yielding both positive and inconclusive results. Research by Yilmaz (2017) found that LMS platforms can significantly improve student engagement, knowledge retention, and overall academic achievement when effectively used. Conversely, studies like that of Almarashdeh (2016) suggest that poor LMS design, lack of motivation, and limited interaction can hinder learning and negatively affect performance. In the Nigerian context, LMS adoption is still emerging in many secondary schools, with mixed outcomes. For instance, Afolabi (2021) highlighted that while some schools witnessed improved student performance through LMS usage, others reported minimal academic gains due to technical challenges and insufficient teacher training. This disparity underscores the need to evaluate the implementation and outcomes of LMS in specific educational contexts, such as international private secondary schools in Abuja, where conditions may be more favorable for successful integration.

Despite the potential benefits, several challenges hinder the effective use of LMS in schools. First is the issue of digital divide, where students have unequal access to devices and reliable internet connectivity. Even in well-resourced international schools, disparities may exist in terms of how students interact with LMS based on home support and prior exposure to technology (Agbo, 2015). Second, many teachers lack adequate training in digital pedagogy and struggle to design engaging and interactive LMS-based content. Other challenges include low student motivation, distractions in online learning environments, and system usability issues. These can lead to superficial engagement with learning materials, delays in assignment submissions, and ultimately poor academic performance (Dhawan, 2020). Furthermore, without proper monitoring and feedback mechanisms, students may feel isolated and unsupported.

While a considerable body of research exists on LMS in higher education, relatively fewer studies have focused on its application in secondary schools, especially within the African context. Most Nigerian studies concentrate on public schools or generalize across different

school types, thereby neglecting the unique experiences of international private schools. For example, studies by Nwankwo and Okwudishu (2020) and Eze, Chinedu-Eze, and Bello (2018) discuss technology adoption in Nigerian education but offer little insight into how LMS specifically affects academic performance in premium private institutions. This study fills a crucial gap by focusing on international private secondary schools in Abuja, a context characterized by high technological readiness, diverse student populations, and exposure to global educational standards. By examining the extent of LMS implementation, challenges and its impact of teaching-learning process for students' academic performance in international private secondary schools in Abuja, Nigeria, the study aims to provide nuanced insights and inform best practices for educational technology integration in similar contexts.

Statement of the Problem

The integration of Learning Management Systems (LMS) in education has gained traction globally, with many schools adopting these platforms to improve instructional delivery and enhance student learning outcomes. In Nigeria, the adoption of LMS is increasingly evident in international private secondary schools, particularly in urban centers like Abuja, where schools have the infrastructure, digital tools, and funding to support such systems. These schools are expected to harness the full potential of LMS to drive better academic performance. However, despite the growing presence of LMS in these institutions, questions remain about their actual effectiveness in improving students' academic outcomes. Several international studies have shown positive correlations between LMS usage and academic performance, but others have revealed challenges such as low student engagement, technical difficulties, and limited pedagogical integration, which can offset potential gains. In the Nigerian context, much of the existing research focuses on tertiary institutions or public schools, with little empirical evidence specific to international private secondary schools.

These institutions operate under unique conditions better funding, global curricula, and more technologically literate stakeholders, yet it is unclear whether these advantages translate into improved academic performance via LMS implementation. Additionally, challenges such as user resistance, inconsistent usage patterns, and lack of training may still exist even within these privileged environments. Without a thorough assessment of LMS effectiveness in these contexts, stakeholders may be investing in tools that do not yield commensurate educational benefits. Thus, there is a critical need to evaluate the extent of implementation, challenges and actual impact of LMS on students' academic performance in international private secondary schools in Abuja. This gave rise to the current study, which aims at filling the identified gap or need.

Research Questions

To guide this investigation, the study addressed the following research questions:

1. To what extent are Learning Management Systems (LMS) being utilized in international private secondary schools in Abuja, Nigeria?
2. In what ways has LMS enhanced teaching-learning process for the academic performance of students in international private secondary schools in Abuja, Nigeria?
3. What challenges do schools face in the course of implementing LMS in international private secondary schools in Abuja, Nigeria?

Method

Research Design

The study adopts a descriptive survey research design. The design, according to Creswell and Plano (2018) is suitable for investigating relationships between variables, perceptions, and trends in real-world educational settings, and enables the collection of quantifiable data from an array of respondents. Similarly, Fraenkel, et al. (2012) added that the descriptive approach is instrumental in identifying challenges and proposing improvements based on stakeholder experiences. There is no doubt that staff (teachers and schools' ICT personnel) and students are key stakeholders of modern day secondary school setup, and are instrumental in making their perceptions known in relation to the extent of implementation, challenges and impact of learning management systems on students' academic performance in international private secondary schools in Abuja, Nigeria. This make the design relatively suitable for the study.

Population of the Study

The target population comprises all teachers, ICT personnel and senior secondary school students, one to 3 (SS1-SS3) of the selected international private secondary schools in Abuja, Nigeria. Federal Capital Territory Education Secretariat (2023) stated that there are approximately 25 registered international private secondary schools in Abuja, with a combined population of about 3,000 students and 600 teaching staff, including ICT personnel, hence the population is 3,600 respondents across the private secondary schools. Understandably, international private secondary schools are perceived to be characterized by advanced ICT infrastructure, globalized curricula, and established LMS usage, hence the choice.

Sample and Sampling Technique

A sample size of 375 respondents was drawn through a multi-stage sampling procedure. This was composed of 50 teachers, 10 ICT personnel, and 250 students. At first, purposive sampling was adopted in selecting five international private secondary schools based on their perceived active LMS usage for at least two academic years and a student population exceeding 200. Secondly, respondents were drawn from each school using stratified random sampling, ensuring fair representation across SS1 to SS3. For this, 60 students were drawn from each of the five sampled schools, and this resulted in a total of 300. Thirdly, 12 teachers were drawn per school through simple random sampling, and this gave a total of 60. Finally, 3 ICT coordinators per school were purposively selected, amounting in 15. This culminated in a total of 375 respondents, being used. The sample size is approximately 10% of the population, which is considered adequate for proportionate representation.

Instrument for Data Collection

The main instrument used to collect relevant data for the study was a structured questionnaire, themed: 'Implementation, Challenges and Impact of Learning Management Systems on Students' Academic Performance Questionnaire (ICILMSSAPQ), and was developed by the researchers. The five Likert structured instrument comprised of four sections, namely: Section A (respondents' data); Section B (extent of LMS implementation); Section C (perceived impact of LMS on students' academic performance), and Section D (challenges limiting LMS usage). Meanwhile, an interview guide was also administered to ICT coordinators to explore qualitative dimensions such as LMS policy implementation, student engagement, system maintenance, et cetera. The five Likert scale rating is as follows: 1 for Very Low Extent

(VLE); 2 for Low Extent (LE); 3 for Moderate Extent (ME); 4 for High Extent (HE), and 5 for Very High Extent (VHE).

Validation of the Instrument

To ensure face and content validity, the questionnaire (ICILMSSAPQ), and interview guide were reviewed by three experts, one is Educational Technology specialist, and two are Measurement and Evaluation specialists. Their inputs guided the researchers in revising the instruments for clarity, relevance, and alignment with the research questions.

Reliability of the Instrument

A pilot study was conducted using 30 respondents from two international schools in Lagos, which were not involved in the main study. Cronbach's alpha was computed to determine the internal consistency of the questionnaire (ICILMSSAPQ), and a reliability coefficient of 0.78 was obtained, and considered adequate.

Method of Data Collection

The data collection process spanned for a period of four weeks, through a combination of direct and online administrations. The administration was done with the help of researchers and five trained research assistants, after the participating schools and respondents were duly informed of the voluntary and confidential nature of the study through relevant consent letters. Due to a follow-up strategic approach deployed, 100% of the completed questionnaire (ICILMSSAPQ) was retrieved, and used for the data analysis.

Method of Data Analysis

Basically, the data analysis was done through descriptive statistics tools, namely: mean and tables. The analysed data was quantitatively presented on tables, and qualitatively interpreted in line with the various research questions. The following range of values aided the researchers in making relevant item-based remarks and interpretations:

1.0	-	1.49	=	Very Low Extent (VLE)
1.50	-	2.49	=	Low Extent (LE)
2.50	-	3.49	=	Moderate Extent (ME)
3.50	-	4.49	=	High Extent (HE)
4.50	-	5.00	=	Very High Extent (VHE)

Result

Research Question 1: To what extent are Learning Management Systems (LMS) being utilized in international private secondary schools in Abuja, Nigeria?

Table 1: ***Mean ratings of respondents regarding the extent to which learning management systems are being implemented in international private secondary schools in Abuja, Nigeria.***

S/N	Implementable LMS platforms	N	Mean	Remark
1.	Google Classroom	375	2.95	ME
2.	Microsoft Teams for Education	375	2.62	ME
3.	Moodle	375	2.51	ME
4.	Schoology	375	2.63	ME
5.	ULesson	375	3.48	ME
6.	Edmodo	375	2.53	ME
7.	Canvas LMS	375	2.50	ME
8.	Seesaw	375	2.55	ME

Table 1 presents the findings on the extent to which learning management systems are being implemented in international private secondary schools in Abuja, Nigeria. As can be seen from table 1, the mean rating for each item falls within the range 2.5 to 3.49, which are classified as moderate extent (ME). This implies that learning management systems platforms are moderately implemented in international private secondary schools in Abuja, Nigeria. these LMS platform include: Google Classroom, Microsoft Teams for Education, Moodle, Schoology, uLesson, Edmodo, Canvas LMS, and Seesaw.

Research Question 2: In what ways has LMS enhanced teaching-learning process for the academic performance of students in international private secondary schools in Abuja, Nigeria?

Table 2: Mean ratings of respondents regarding the extent to which LMS is enhancing teaching-learning process for the academic performance of students in international private secondary schools in Abuja, Nigeria.

S/N	LMS impacts on teaching-learning process	N	Mean	Remark
9.	LMS supports inclusive learning and accommodates diverse learning styles and paces	375	3.51	HE
10.	LMS promotes learner autonomy and increase instructional effectiveness.	375	3.98	HE
11.	LMS enhances assessment and immediate feedbacks, helping students understand their learning gaps and work toward improvement	375	3.70	HE
12.	LMS fosters communication between teachers and students through integrated tools such as messaging systems, discussion forums, and video conferencing.	375	3.72	HE
13.	LMS data support personalized learning interventions and instructional decision-making through tracking and analytics system	375	3.62	HE
14.	LMS platforms serve as tools for continuous professional development for educators.	375	3.51	HE

Result on table 2 pointed out that individual items, ranging from 9 to 14 attracted a range of mean ratings (3.5 to 4.49), which is considered to be high extent (HE). This implies that to a

high extent, LMS is enhancing teaching-learning process for the academic performance of students in international private secondary schools in Abuja, Nigeria. This means that among other things, LMS supports inclusive learning and accommodates diverse learning styles and paces; promotes learner autonomy and increase instructional effectiveness; enhances assessment and immediate feedbacks, helping students understand their learning gaps and work toward improvement; fosters communication between teachers and students through integrated tools such as messaging systems, discussion forums, and video conferencing; support personalized learning interventions and instructional decision-making through tracking and analytics system, and serve as tools for continuous professional development for educators.

Research Question 3: What challenges do schools face in the course of implementing LMS in international private secondary schools in Abuja, Nigeria?

Table 3: Mean ratings of respondents regarding the challenges schools face in the course of implementing LMS in international private secondary schools in Abuja, Nigeria.

S/N	Challenges limiting the implementation of LMS in teaching-learning process	N	Mean	Remark
15.	Inadequacy of LMS supportive infrastructure and connectivity	375	2.67	ME
16.	Limited digital literacy among teachers and students	375	2.69	ME
17.	Staff and students' attitudinal barriers with resistance to change	375	2.68	ME
18.	Financial constraints and limited budgets	375	2.72	ME
19.	Inadequacy of institutional and policy support	375	2.79	ME
20.	Reoccurring technical issues with poor system maintenance	375	2.66	ME
21.	Socioeconomic disparities and the digital divide	375	2.57	ME

Result on table 3 pointed out that individual items, ranging from 15 to 21 attracted a range of mean ratings (2.5 to 3.49), which is considered to be moderate extent (ME). This implies that to a moderate extent, there are challenges limiting most schools from fully implementing LMS. This means that despite the role LMS plays in teaching-learning process, schools are still facing challenges, making it difficult for optimization of it benefits. The challenges include: inadequacy of LMS supportive infrastructure and connectivity; limited digital literacy among teachers and students; staff and students' attitudinal barriers with resistance to change; financial constraints and limited budgets; inadequacy of institutional and policy support; reoccurring technical issues with poor system maintenance, and socioeconomic disparities and the digital divide.

Discussion of Findings

The study revealed that several Learning Management System (LMS) platforms are moderately in use across secondary schools, particularly in private and international schools in Abuja, Nigeria. Prominent platforms identified include Google Classroom, Moodle, Edmodo, and proprietary platforms developed by school IT departments or contracted firms. Google Classroom was reported as the most widely used LMS, primarily due to its user-friendliness,

integration with other Google tools (e.g., Google Docs, Google Meet), and free access. Its cloud-based nature allows for easy sharing of assignments, classwork, and feedback, making it ideal for real-time learning and collaboration. Moodle, an open-source platform, was mostly adopted by more technologically advanced institutions due to its customization flexibility and robust functionality, including plugins for assessment, grading, and student tracking (Ifinedo, 2017). Edmodo was also observed in a number of schools as a popular choice, especially during the COVID-19 pandemic, for its social media-style interface that encouraged student interaction. However, the adoption rate varied significantly across public and private institutions, with public schools lagging behind due to infrastructural and funding limitations. These findings align with the work of Al-Fraihat et al. (2020), who noted that accessibility, ease of use, and institutional support significantly influence LMS adoption in educational settings. The presence of proprietary LMS platforms was more common in international private schools with better ICT infrastructure and funding.

The study further found that LMS platforms play a significant role in transforming the teaching and learning process in Nigerian secondary schools; facilitate blended and flipped classroom models; enhance communication between teachers and students; enhance assessment and feedback mechanisms; improved instructional delivery, better student engagement, and more effective learning outcomes. This ensured that students could engage with course content beyond school hours and at their own pace, accommodating different learning styles. The findings are supported by different scholarly reports. Oye et al. (2012), who emphasized the value of LMS in promoting flexible, self-directed learning. Part of the findings align with the findings of Dhawan (2020), who noted that blended learning approaches increase learner autonomy and academic engagement. Martin et al. (2020) similarly concluded that LMS platforms improve academic performance by offering personalized feedback and continuous assessment. Also, the outcomes reflect Hrastinski's (2019) assertion that LMS platforms foster learner interaction and engagement. These show that LMS is a valuable assert in enhancing teaching-learning encounters, for improved academic performance.

The study also found a level of resistance to the use of LMS among educators; inadequacy and dysfunctional LMS supportive infrastructure; lack of coherent policies and institutional frameworks to support LMS integration in schools; significant financial and budgetary limitations; some teachers' lack of technical expertise required to effectively navigate LMS platforms, leading to LMS being underutilized. The findings are in tandem with some scholarly reports. The findings support Tella (2012), who observed that power supply and internet access are major constraints to e-learning adoption in sub-Saharan Africa. This report is consistent equally with the findings of Akinola (2021), who emphasized the need for digital literacy in the successful deployment of e-learning systems. Similarly, while Akinola (2021) noted that insufficient education financing is a major impediment to digital transformation in Nigeria's education sector, Okoye and Bello (2021) argued that digital education in Nigeria suffers from poor policy implementation and coordination, and private schools are not exemption.

Conclusion

The study revealed there is a moderate level of LMS usage across these institutions, which evident that the platforms are not yet fully embedded as standard pedagogical tools across the curriculum. LMS platforms were noted to play a highly beneficial role in enhancing teaching and learning by facilitating greater access to learning materials, support differentiated instruction, enable interactive and personalized learning experiences, and provide mechanisms for

continuous assessment and feedback. The study also uncovered a range of persistent challenges that continue to hinder the full-scale adoption and optimization of LMS tools, including but not limited to: infrastructural deficits, limited internet access, digital literacy gaps among both teachers and students, financial barriers, and underdeveloped institutional policies and frameworks for LMS implementation in some schools. These findings underscore a critical the need for a systematic and strategic approach to LMS integration, which goes beyond hardware acquisition to include capacity building, policy formulation, stakeholder engagement, and sustainability planning. This study contributes valuable insights into the evolving digital education landscape in Nigeria and provides a foundation for future research and policy direction. Hence, as education systems worldwide continue to digitize, international private secondary schools in Abuja stand at the threshold of innovation, while LMS offers a critical tool for bridging pedagogical gaps, enhancing instructional quality, and preparing students for a globally competitive future.

Recommendations

Based on the findings that LMS platforms are moderately used in international private secondary schools in Abuja; LMS significantly enhances teaching and learning outcomes, and challenges continuing to hinder widespread adoption and effective use, the study offers the following strategic recommendations aimed at strengthening LMS integration, improving digital pedagogy, and overcoming adoption barriers to enhance teaching and learning in secondary school environments.

1. School management should ensure that institutional investment in LMS infrastructure is strengthened to support full-scale deployment. For instance, specific budget lines for ICT development, including hardware and software licenses, internet bandwidth and Wi-Fi coverage, and digital learning centers or e-libraries should be increased for relevant upgrades in LMS architecture. These kind of investments will create a more enabling environment for LMS use and ensure that both teachers and students can access learning tools with minimal technical interruptions.
2. To transition from moderate to full LMS adoption that optimizes teaching-learning process, management of the various international private schools in Abuja should embed LMS usage into institutional curricula and teaching policies, by making LMS integration a standard component of lesson planning and delivery across subjects, establish LMS usage benchmarks for both staff and students, such as a minimum number of weekly activities, assignments, or discussions to be hosted online, and development of an institutional LMS policy that outlines responsibilities, expectations, digital conduct, and performance assessment measures. Undoubtedly, a structured policy framework will foster consistency, accountability, and pedagogical alignment, making LMS a central feature of the teaching-learning process, and consequently enhanced students' academic attainments.
3. To mitigate the challenges limiting the potentials of LMS, school management should intensify continuous professional development for teachers; enhance student orientation and support structures; address access equity and cost barriers; promote stakeholder collaboration and partnerships; institutionalize LMS in emergency response plans, as well as establish monitoring and evaluation mechanisms. There is need for training on best practices for online pedagogy, including how to manage virtual classrooms, promote student engagement, peer-support forums for students to navigate technical challenges,

lending schemes (where students can borrow tablets or laptops for home use), and provide LMS feedback architecture. It is important to emphasize that the successful implementation of LMS requires collaboration between school management, teachers, parents, ICT vendors, and policymakers, as well as regular data collection and analysis that will allow school leaders to make evidence-based decisions and continuously improve LMS implementation strategies. This approach will enhance LMS and ensure that learning is optimized.

References

Adarkwah, M. A. (2021). "I'm not against online teaching, but what about us?" ICT in Ghana post Covid-19. *Education and Information Technologies, 26*(2), 1665-1685. https://doi.org/10.1007/s10639-020-10331-z

Adedoyin, O. B., & Soykan, E. (2020). COVID-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments,* 1-13. https://doi.org/10.1080/10494820.2020.1813180

Afolabi, A. (2021). Adoption of learning management systems in Nigerian secondary schools: A case study of Lagos and Abuja. *Journal of Education and Technology, 4*(2), 45-56.

Agbo, I. S. (2015). Factors influencing the use of learning management systems in Nigerian higher education institutions. *Journal of Education and Practice, 6*(25), 61-65.

Ajadi, T. O., & Olayemi, T. M. (2021). Comparative analysis of Edmodo and Google Classroom in Nigerian secondary education. *Nigerian Journal of Educational Media and Technology, 25*(1), 33-42.

Akinola, A. (2021). Education financing in Nigeria: An overview of budgetary allocation and challenges. *Journal of Economic and Social Studies, 13*(1), 44-56.

Akinola, J. O., & Adebayo, R. T. (2023). Exploring digital learning management systems in private secondary schools in Nigeria. *African Journal of Educational Technology, 5*(2), 45-59.

Al-Fraihat, D., Joy, M., Masa'deh, R., & Sinclair, J. (2020). Evaluating E-learning systems success: An empirical study. *Computers in Human Behaviour, 102*, 67-86.

Almarashdeh, I. (2016). Sharing instructors experience of learning management system: A technology perspective of user satisfaction in distance learning course. *Computers in Human Behaviour, 63*, 249-255.

Ayo, A. R., & Onifade, T. A. (2021). EdTech for African classrooms: A case study of uLesson's impact in Nigeria. International Journal of Educational Development in Africa, 8(1), 18–30.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research (3rd ed.).* SAGE Publications.

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5-22.

Eze, S. C., Chinedu-Eze, V. C., & Bello, A. O. (2018). The utilisation of e-learning facilities in the educational delivery system of Nigeria: A study of M-University. *International Journal of Educational Technology in Higher Education, 15*(1), 1-20.

Federal Capital Territory Education Secretariat. (2023). *School directory and education statistics*. Abuja, Nigeria.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education (8th ed.)*. McGraw-Hill.

González, A., & Paoloni, P. V. (2015). Student academic performance in blended learning courses. *Journal of Educational Research, 58*(3), 205-220.

Hrastinski, S. (2019). What do we mean by blended learning? TechTrends, 63(5), 564–569. https://doi.org/10.1007/s11528-019-00375-5

Ifinedo, P. (2017). Examining students' intention to continue using blogs for learning: Perspectives from technology acceptance model and expectation-confirmation model. *Computers in Human Behaviour, 72*, 189-199.

Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning from 2009 to 2018. *Computers & Education, 159*, 104009. https://doi.org/10.1016/j.compedu.2020.104009

Nwankwo, L. I., & Okwudishu, C. H. (2020). Challenges of ICT implementation in secondary schools in Nigeria. *African Journal of Educational Research, 24*(1), 34-42.

Okoh, C. A. (2019). International private schooling in Nigeria: A sociological perspective. *International Journal of Contemporary Education, 2*(2), 98-108.

Okoye, K. R. E., & Bamidele, M. O. (2022). Adoption of Moodle in Nigerian secondary schools: Opportunities and challenges. *International Journal of ICT in Education, 14*(2), 78-89.

Olaniyi, A. A., & Bello, R. A. (2020). Leveraging LMS in Nigerian private schools: Canvas as a case study. *Journal of Digital Education and Learning, 3*(1), 24-36.

Oye, N. D., Iahad, N. A., Madar, M. J., & Rahim, N. A. (2012). The impact of e-learning on students' performance in Nigerian tertiary institutions. International Journal of Computer Networks and Wireless Communications, 2(2), 121–130.

Tarus, J. K., Gichoya, D., & Muumbo, A. (2015). Challenges of implementing e-learning in Kenya: A case of Kenyan public universities. *The International Review of Research in Open and Distributed Learning, 16*(1), 120-141.

Tella, A. (2012). Determinants of e-learning implementation in higher institutions in Nigeria: A factor analysis approach. *International Journal of Information and Education Technology, 2*(1), 1-6.

Uche, G. C., & Nwachukwu, I. O. (2023). Enhancing digital engagement through Seesaw in Nigerian junior secondary schools. *West African Journal of Instructional Technology, 9*(2), 112-126.

Yilmaz, R. (2017). Exploring the role of e-learning readiness on student satisfaction and motivation in flipped classrooms. *Computers in Human Behavior, 70*, 251–260.