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Mobile Pedagogy in Higher Education: A Comprehensive Analysis of Mobile Learning Practices for Classroom Management in Usmanu Danfodiyo University, Sokoto State, Nigeria

Usman Abubakar
Federal College of Education Gidan Madi, Nigeria
Coresspondent : Usman4realonline@gmail.com

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ABSTRACT: The study investigated the awareness, utilization, and relevance of mobile devices for classroom management at Usmanu Danfodiyo University Sokoto State, Nigeria. A descriptive survey research design was used for the study. The study was guided by three research questions. The population of the study comprises all lecturers of Usmanu Danfodiyo University Sokoto. Multistage sampling technique was used; first stage, simple random sampling was used, second stage, proportionate sampling, third stage, snowball sampling technique was used to select a total sample of 526 respondents (165 lecturers). The instrument used for data collection was the researcher's self-constructed questionnaire titled Lecturers' Perception on the Utilization of Mobile Devices in Teaching (LPUMT) which was validated by experts and pilot-tested, yielding a reliability index of 0.67 through Cronbach Alpha analysis. Frequency counts and percentages were used to analyze the demographic information and answer the research questions. The study's findings revealed that lecturers are aware of and use mobile devices in classroom management. The study has also confirmed the relevance of mobile devices in classroom management at UDUS. The study recommends awareness programs that will enable lecturers to recognize the importance of using mobile technology in the educational system. The study also recommends Viable learning programs and applications accessible using mobile devices for both teachers and students in tertiary institutions should be created. These initiatives, as suggested by the study, are crucial for harnessing the full potential of mobile pedagogy in higher education settings.

Keywords: ICT, Mobile devices, Mobile learning, Classroom management.

INTRODUCTION

The integration of mobile technologies in higher education has indeed transformed traditional teaching and learning paradigms, offering new opportunities for educators to enhance classroom management and pedagogical strategies. The widespread use of mobile devices, including smartphones and tablets, has prompted educators to explore their potential to reshape the learning experience (Uzunboylu, 2019). In the Nigerian context, specifically at Usmanu Danfodiyo University in Sokoto State, the adoption of innovative teaching methods has become essential to meet the evolving needs of students. This dynamic academic environment necessitates the

exploration of new trends in educational technology to ensure that students are adequately prepared for the demands of the modern world (Hürsen, 2017).

The educational standards in Nigeria's tertiary institutions have been a subject of concern due to the observed decline in the quality of teaching and learning. This decline has been attributed to the predominant use of traditional face-to-face teaching methods (Mohammed et al., 2020). This was also supported by Oyewole and Osalusi (2016) highlighting that the standard of education in Nigeria has become a paramount issue for national debate, with concerns about its decline being linked to the traditional face-to-face teaching model. The impact of this traditional teaching model has led to a decrease in educational standards, aggravated by the substantial increase in the number of students in Nigeria's tertiary institutions over the years (Mohammed et al., 2020).

The longing to acquire education brought forth the population explosion in Nigerian tertiary institutions and massive enrolment of students in tertiary institutions in Sokoto State. Educational facilities available have been exhausted by the number of students who want to acquire advanced education. An average public tertiary institution in Sokoto has a population of over 20,000 students with about 300 to 500 students in a lecture hall. It is certainly difficult if not impossible for a lecturer using conventional means to manage and have total control of over 500 students, as a result, the sitting arrangement becomes a complex situation where some of the students are seated closely and some are standing while some are even hanging outside the class. A highly populated class doesn't encourage effective teaching and learning. Overcrowding students in a class can cause a lack of control thereby causing a negative effect on the students (Alyssa, n.d.). This is a challenging situation of great concern that requires an immediate solution.

With the increasing number of students in Sokoto State tertiary institutions, mobile devices can be used to bridge the communication gap between lecturers and students. However, a piece of software application that supports this adoption is needed (Kinsella, n.d.). Mobile devices enable flexible learning, eliminating the constraints of time and space. The penetration of internet-based technologies into the educational circle has changed its primary function from a mere communication tool to a learning tool. This view was supported by Amanda (2015), who noted that mobile devices have evolved from verbal communication tools to multimedia tools that enhance the teaching and learning process. According to Suki and Suki (2009), teachers rely heavily on mobile devices to deliver and assess their teaching material, including tutorials, lecture notes, and lab sessions. By using internet-based technologies, educational delivery in Nigerian tertiary institutions can be improved through innovative methods that complement traditional approaches.

Considering the potency and effectiveness of using mobile devices in Nigerian tertiary institutions, the questions were raised by the researcher: Are lecturers at Usmanu Danfodiyo University Sokoto aware of the enormous potential that mobile devices offer to education? What are the lecturers' views about using mobile devices in the classroom? Do lecturers consider the use of mobile devices relevant for classroom management? A series of these questions impel the researcher to study ICT in classroom management in Usmanu Danfodiyo University Sokoto.

For this study; Information and Communication Technology (ICT) is the application of modern technology to generate information and communication through sophisticated electronic devices (Eya, n.d.). ICT is an umbrella term that includes all kinds of electronic devices used for communications broadcast and mediated communications, including personal computers, video games, mobile phones and tablets, internet and electronic payment systems, computer hardware and software, satellite systems and so on (K.m, P. 2018). ICT, therefore, includes devices such as desktop and laptop computers, mobile phones, software, peripherals, and internet-based facilities that are used for information processing and communication functions.

Mobile devices refers to devices that are both transportable and offer instantaneous access to information (Coates, Dearnley, Dransfield, Fairhall, Haigh, Hennessy, Parks, Riley: & Taylor, 2009). Mobile devices can be seen as portable technologies that use wireless networks to perform various tasks. Lina & Angelin (2017) see mobile devices as any portable, connected technology, such as basic mobile phones, smartphones, PDAs, e-readers, notebooks, tablets, iPads and laptops(Lina & Angelin, 2017). Mobile devices are typically used to describe portable devices that are easy to move around, and connected to the internet.

Mobile learning has been recognized as a relatively new phenomenon that has grown widely in recent years, offering numerous merits that can significantly improve the quality of instruction (Dashtestani, 2015). Mobile learning, also known as m-learning, is a form of learning that involves the use of mobile technologies to facilitate education, allowing for learning to take place at any time and in any location (Hwang & Tsai 2011). It is often considered an extension of e-learning, with materials being delivered through mobile technology such as devices and wireless networks (Park, 2011). Additionally, mobile learning is seen as a part of electronic learning or e-learning, and it involves learning from different perspectives and the use of mobile devices to learn (Setyawan et al., 2018). Mobile learning is also associated with using mobile technologies to learn at any time and location, and it involves learning from different perspectives and using mobile devices to learn (Mohammadi et al., 2020). It is also seen as a method of ubiquitous learning, with potential benefits for students' attitudes, readiness, and overcoming barriers to implementation in higher education(Alhassan, 2016). Mobile learning encompasses a range of characteristics that make it a flexible, accessible, and potentially effective approach to education. It offers opportunities for personalization, self-regulated learning, and the facilitation of learning in diverse contexts.

Classroom management refers to the wide variety of skills and techniques that teachers use to keep students organized, orderly, focused, attentive, on task, and academically productive during a class. Philomena and Temitayo (2019) see classroom management as a process involving the organization of certain academic tasks that are essential for effective teaching and learning in a specific setup. Classroom management is the planning, management and execution of the school programs as it affects teaching and learning in the classroom(Philomena & Temitayo, 2019).

Transformative Impact of Technological Innovations in Education

Technological innovations have indeed significantly impacted the education sector, leading to transformative changes in teaching and learning processes. The rate at which technology is

currently used in education, and is rapidly replacing the traditional way of processing information. Impressive advances in technology over the past few years provide new hope for technological solutions (when intelligently applied) that pave the way for greater access, higher quality and lower cost in educational delivery. The innovations have been found to significantly impact learners' satisfaction and the overall development of educational processes (Sriram, 2015). The school innovation climate has been shown to positively impact educational technology use, highlighting the role of the environment in facilitating technology acceptance among teachers (Kaewsaeng-on et al., 2022). Moreover, introducing smart mobile devices has brought broad innovations into the education field, promoting self-directed, motivated, adaptive, resource-enriched, technology-embedded education (Leem & Sung, 2018). Management education has also been found to influence enterprise scientific and technological innovation, emphasizing the interconnectedness of education and technological advancement (Ma et al., 2022).

Integrating technological tools in education, such as mobile applications, aims to make educational processes more dynamic and improve learning experiences (Campos et al., 2022). Additionally, technology integration in education has been linked to the development of critical and creative thinking, multidimensional 21st-century skills, and academic achievements among prospective teachers (Yilmaz, 2021). The role of technology in education extends beyond traditional teaching and inquiry tools, evolving into an integrated approach that encompasses various aspects of the educational process (Tuma, 2021). Furthermore, the digitization of society and the popularity of information technologies have become integral parts of teaching worldwide, highlighting the global impact of technological advancements in education (Blyznyuk, 2019). The transdisciplinary role of technology in education has been a subject of extensive research, offering diverse perspectives on its essence and impact (Karakaş & Hidiroğlu, 2022). Moreover, educational institutions have played a significant role in constructing the value of technologies in education, contributing to categorical inequality and hierarchies of technological activity (Rafalow & Puckett, 2022).

The ever-changing context of the information society in tertiary institutions has created more significant challenges for redesigning the learning process to align with current technological innovations(Akpokodje & Lawai, 2017). The continuing use of Information and Communication Technology (lCT) to support teaching and learning has also provided significant opportunities for teachers to explore and formulate new ways of delivering educational services (Mudassiru, 2005). Mobile devices can be of great benefit to educators. Anigbo (2015) observed that teachers use their mobile devices to access educational resources, connect with others, or create content, both inside and outside the classroom. Anigbo (2015) further observed that ubiquitous mobile devices especially smartphones are being used by teachers around the globe to access information to restructure their administration and facilitate learning in new and innovative ways(Anigbo, 2015). This statement was supported by Norbayah and Norazah (2006), when they stated that, teachers rely heavily on mobile phones in assessing/delivering their teaching material such as a tutorial, lectures, and lab sessions in the universities. They like the idea as it is instrumental, novel and practical. They find it more convenient to use mobile technology for teaching, but it still depends on the learning situation and conditions.

The Unified Theory of Acceptance and Use of Technology (UTAUT) as proposed by Venkatesh et al., (2003), provides a theoretical framework for understanding the factors influencing the acceptance, adoption, and use of technology in an organizational context(Venkatesh et al., n.d.). In the investigation of mobile pedagogy at Usmanu Danfodiyo University, UTAUT serves as a guiding theory to analyze how various stakeholders, including lecturers, perceive and integrate mobile learning practices into their educational activities. The theory holds that there are four key constructs: (1) performance expectancy, (2) effort expectancy, (3) social influence, and (4) facilitating conditions, to help understand the complexities of technology adoption and its impact on classroom management. By exploring these factors, the research aims to understand how the acceptance and use of mobile technology influence classroom dynamics, student engagement, and overall teaching effectiveness.

1. Performance Expectancy: Investigating the extent to which users believe that mobile learning practices will help them achieve better academic performance. How do students and instructors perceive the benefits of mobile technology in enhancing learning outcomes and classroom management?
2. Effort Expectancy: Examining the perceived ease of use associated with mobile learning practices. How do stakeholders assess the simplicity and convenience of integrating mobile devices and applications into their educational activities, and how does this perception impact classroom engagement?
3. Social Influence: Analyzing the impact of social factors on the acceptance of mobile pedagogy. How do peer influence, instructor recommendations, and societal expectations shape the decision to adopt mobile learning practices, and subsequently, influence classroom management?
4. Facilitating Conditions: Investigating the supporting conditions that enable or hinder the use of mobile technology. This includes exploring the availability of resources, infrastructure, and institutional support for the effective integration of mobile devices and applications in the academic environment. UTAUT serves as a guiding theoretical framework to explore the complex dynamics of technology acceptance and use within the context of mobile pedagogy. By focusing on key constructs, the research aims to uncover insights into how these factors shape classroom management practices and contribute to the overall success of mobile learning initiatives at Usmanu Danfodiyo University.

The utilization of mobile devices in the instructional process is somewhat new yet in its rudimentary stage. Despite this shortcoming, however, there are number of initiatives and research studies that have been conducted in that area. A study investigates, diffusion of smartphones and tablets in higher education: A comparison of faculty and student perceptions and use by Rellinger (2014). The findings of the investigation shows that faculty members and students strongly believe that, using smartphones/tablets in teaching and learning displayed more significant benefits. The findings also show that faculty members and students felt comfortable with the use of smartphones/tablets in the teaching-learning process. In another study, Mobile Phone as Pedagogical Tools: Are Teachers Ready?' by Ismail, Azizan, and Azman, (2013). The study reported that teachers of tertiary institutions are aware of the usefulness of technological gadgets such as mobile phones in schools. Another investigation, Utilization of smartphones in science

teaching and learning in selected universities in Ghana by Twum, (2017)(Twum, 2017). The findings revealed that, mobile phone had great potential as a learning tool and it could positively be used for teaching and learning purposes in science areas.

METHOD

For this study, descriptive survey research design was used. The population of the study comprises all lecturers (1254) of Usmanu Danfodiyo University Sokoto (UDUS). Multistage sampling technique was used to select the sample from the population. In the first stage, simple random sampling was used to select 4 faculties in UDUS. The sample size was determined using Research Advisors (2006), sampling table. From the population of 292, sample sizes of 165 lecturers were recommended. In the second stage, proportionate sampling was used to arrive at the sample size for each faculty within the institution. In the third stage, the snowball sampling technique was used to select respondents (lecturers) according to the proportion of the sampled faculties in the institution under investigation.

The questionnaire titled: Lecturers' Perception on the Utilization of Mobile Devices in Teaching (LPUMT) was the instrument used for data collection in this study. As indicated by Utulu et al., (2012), a questionnaire is an instrument used to obtain information from people or respondents about themselves, other people, or objects around them(Utulu & Alonge, 2012). The instrument, LPUMT is a self-constructed questionnaire to elicit responses from lecturers on mobile device adoption. The instrument was presented to the experts in the Faculty of Education and Extension Services at UDUS for necessary corrections and adjustments, which helped make it valid for this investigation. To test the reliability of the instruments (LPUMT), a pilot study was conducted at Sokoto State University (SSU) where 20 lecturers were randomly selected and administered with the instrument. The data obtained was subjected to the Cronbach Alpha reliability test. A reliability index of 0.67 was obtained, which is high enough to ensure the reliability of the instrument. Data generated from the instrument was used to answer the research questions raised in this study. According to Chukwuma (2012), a questionnaire is an instrument used to acquire information from people or respondents about themselves, other people, or objects around them. The reason for selecting a questionnaire as an instrument for this study is that with the questionnaire, large amount of information can be collected from a larger population within a shorter period and the result can be quickly analyzed. Data collected was analyzed using Statistical Package for Social Sciences (SPSS). The study employs frequency counts and percentages to interpret demographic information and answer the research questions.

Table 1: Sample size of the Study

S/N	Faculty/College	Lecturers Number of respondents	Sample
1.	Agriculture	98	55
2.	Engineering	35	20
3.	Management Science	56	32
4.	Social Science	103	58

	TOTAL	**292**	**165**

RESULT AND DISCUSSION

Lecturers' Demography

The presentation and analysis of data begin with the bio-data of the respondents and interpretation of findings from the research questions. Findings of this study indicated that; concerning the educational qualification of the respondents, 96 lecturers, representing 58.2% of the respondents have Ph.D. 56 lecturers, representing 33.9% of the respondents have Master's Degree, while 13 lecturers representing 7.9% of the respondents have Bachelor's Degree. The result also shows frequency and percentage based on gender; 153 lecturers representing 92.7% of the respondents are male while 12 lecturers representing 7.3% are female.

With regards to ownership of mobile devices; 165 lecturers representing 100% of the respondents responded yes, they have mobile devices. This means that all the respondents (lecturers) have mobile devices. As regards to the types of mobile devices owned by the respondents, 8 lecturers representing 4.8% of the respondents have smartphones only. While 10 lecturers representing 6.1% of the respondents have laptops only. Another 70 lecturers representing 42.4% have both smartphones and laptops. 26 lecturers representing 15.8% of the respondents have both smartphones and iPads. Another 4 lecturers representing 2.4% of the respondents have both smartphones and tablets. While 19 lecturers representing 11.5% of the respondents have smartphones, laptops and iPads. Another 23 lecturers representing 13.9% of the respondents have smartphone, laptop and tablet, while 5 lecturers representing 3% of the respondents have smartphone, laptop, iPad and tablet. None of the respondents owns PDA, e-reader and notebook. This shows that respondents with the highest percentage are lecturers who owned both smartphones and laptops only.

Research Question 1: Are lecturers in Usmanu Danfodiyo University Sokoto aware of the enormous potentials that mobile devices offer to education?

The responses from the research question were analyzed using frequency count and percentages. Analysis of data used to answer research question one indicates (162)98% (lecturers) goes to the respondents who are aware of mobile devices use in the instructional process. Those with contrary opinions scored (3)2%. This shows that those that are aware score higher (98%) than those with contrary opinions hence it is concluded that lecturers are aware of mobile devices use for classroom management in Usmanu Danfodiyo University Sokoto.

Research Question 2: What is the view of lecturers on the use of mobile devices in classroom management in Usmanu Danfodiyo University Sokoto?

The responses indicate that (143)86.7% (lecturers) was obtained for the respondents with a positive view on the use of mobile devices in classroom management in UDUS and those with negative opinions scored (22)13.3%. This shows that those with a positive view score higher (86.7%) than those with a negative opinion, hence it is concluded that lecturers utilize mobile devices in classroom management in Usmanu Danfodiyo University Sokoto.

Research Question 3: Do lecturers consider the use of mobile devices relevant for classroom management in Usmanu Danfodiyo University Sokoto?

Analysis of data used to answer research question three indicates that (153)93% (lecturers) goes to the respondents with a positive perception of the relevance of mobile devices in classroom management. Those with negative perceptions scored (12)7%. This shows that those who agree score higher (93%) than those with contrary opinions hence it is concluded that lecturers consider the use of mobile technology relevant to classroom management in Usmanu Danfodiyo University Sokoto.

The study revealed that lecturers are aware of the use of mobile devices in classroom management in Usmanu Danfodiyo University Sokoto. This finding corresponds with that of Ismail, Azizan, and Azman, (2013), who reported that teachers of tertiary institutions are aware of the usefulness of technological gadgets such as mobile phones in schools. The study of Ismail, Azizan, and Azman is related to this study as they are both concerned with the use of mobile technology in education but differ as their study focus only on the use of mobile phone in teaching as opposed to this study where all mobile devices are part of the investigation(Ismail et al., 2013).

The result of this study also revealed that lecturers use mobile devices in classroom management in Usmanu Danfodiyo University Sokoto. The result of this research work was in agreement with that of Rellinger (2014), where he reported that lecturers are comfortable with the use of smartphones/tablets in the teaching and learning process. He added that learning with smartphone/tablet is easier and beneficial with more practice due to the less complex nature of the devices. The investigation of Rellinger is related to this study as they are both concerned with the use of mobile technology in tertiary institutions, but his investigation was limited to the use of smartphones and tablets in teaching and learning as opposed to this study where all mobile devices were considered part of the investigation.

The result of this study further revealed that lecturers consider the use of mobile technology relevant for classroom management in Usmanu Danfodiyo University Sokoto. This is in line with the investigation by Rellinger (2014) who found that lecturers strongly believe that, using smartphones/tablets in teaching and learning displayed more significant benefits. He also considers the use of smartphones/tablets easier and more beneficial in the teaching-learning process(Rellinger, 2014). This was corroborated by Twum (2017) who observed that mobile phone had great potential as a learning tool and it could positively be used for teaching and learning purposes. Both investigations are related to this study as they are all concerned with the use of mobile technology in tertiary institutions, but the investigation of Rellinger and that of Twum was limited on the use of smartphones and tablets in teaching and learning in tertiary institutions as opposed to this study where all mobile devices were considered part of the investigation.

CONCLUSION

The outcomes of this investigation affirm that lecturers at Usmanu Danfodiyo University Sokoto are not only aware of the potential of mobile devices but also actively embrace and consider them

relevant for effective classroom management. The positive attitudes observed among lecturers pave the way for further exploration and integration of mobile technology in the educational landscape, fostering innovative and engaging learning environments. The use of mobile technology in the instructional process is crucial due to its utility, ease of use, and affordability, these devices are well-placed to expand educational opportunities for lecturers and students in diverse contexts, including areas where traditional education resources are scarce. Lecturers have a lot to offer using these devices because the devices can allow lecturers gain access to educational information for the students from anywhere any time and lecturers can use these devices to give feedback and to inform students faster. For this reason, the use of mobile devices should be given more emphasis in the educational world. Past researches as seen in the literature had limited their investigation on the use of one or two of these devices in education and the response were relatively very low. However, this study considers all mobile devices as part of the investigation and the study reveals a considerable increase in positive response to mobile technology use in education. This could be due to greater awareness and adoption of new technologies in various domains, particularly in the education sector, as seen in the last few years. Although the findings of this research indicate an improvement in mobile device use over previous studies, a small percentage of lecturers still consider the use of mobile technology in education ineffective, given the fact that mobile technology is a tool for instructional delivery, lecturers can only benefit from these technologies if they agree to use them in their educational pursuits.

Recommendations

Based on the findings of the study, the following recommendations were made to further enhance the integration of mobile devices in classroom management at Usmanu Danfodiyo University Sokoto:

1. Implement professional development programs through workshops, seminars, or training sessions for lecturers to enhance their proficiency in utilizing various mobile devices for instructional purposes.
2. Ensure that the university's infrastructure supports the seamless use of mobile devices in classrooms, including reliable power supply and high-speed internet connectivity.
3. Formulate and communicate clear institutional policies that encourage and support the integration of mobile technology in classroom management by establishing guidelines for the responsible and ethical use of mobile devices to maintain a conducive learning environment.
4. Encourage lecturers to explore diverse pedagogical approaches that influence the unique features of mobile devices, promoting interactive and student-centered learning by fostering collaboration among lecturers to share best practices and innovative teaching strategies that incorporate mobile technology.
5. Facilitate collaboration between lecturers and educational technology experts to explore emerging trends and innovations in the use of mobile devices for education by establishing a support system for lecturers to consult with experts when integrating new technologies into their teaching methods.

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