Research Article

MOBILE LEARNING FOR HIGHER EDUCATION IN NIGERIA: PROSPECTS AND CHALLENGES

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Abstract

The deployment of mobile technology for education has changed the traditional approach to teaching and the learning processes, by exposing both teachers and learners to educational experiences regardless of location, anytime. The utilization of mobile technology for higher levels of education, is unavoidable if individuals are to be adequately equipped for their roles in modern society that emphasizes collaboration. Mobile technology in education not only enables individuals to participate in learning anytime and anywhere, but fosters their collaboration and the development of lifelong learning skills. Stakeholders globally have recognized the potential of mobile devices in education and have continued to consistently deploy them in their national educational systems at all levels for the improvement of teaching and learning. Most developing countries, including Nigeria have continued to struggle with the integration of Information Communication Technology (ICT) into their educational sectors. This paper examined ICT and the educational benefits of it, for higher learning in Nigeria and the challenges of integrating mobile devices.

Keywords: Information communication technology; mobile learning; higher education

Introduction

Information and Communication technology (ICT) is becoming increasingly more powerful and relevant in human activities globally. It has permeated into many facets of human activities, which include tourism, health, commerce, agriculture, education, etc. ICT can be extensively harnessed and deployed to improve the pace and level of development of teaching and the learning processes in higher education (Twining & Henry, 2014; Olafare et al., 2017). The integration of ICT to improve instruction, especially its importance in supporting learner-centered education has been widely discussed (American Psychological Association, 1997; Commission of the European Communities, 2008; Phungsuk et al., 2017). While most of the developed countries have integrated ICT in their educational activities, the developing countries are making efforts to achieve its integration into their systems (Simeo et al., 2015), however, these efforts are yet to yield the desired results in Nigeria.

As ICT evolves, the devices are becoming smaller and more powerful in their functions making them more essential and easier to use for information gathering. Recent findings on the spread and use of mobile devices, revealed a huge growth and penetration of them in both developed and developing countries (Johnson et al., 2015). For example, the ownership of these devices in China and the USA is 97% and 90% respectively, with 64% being smart phones, while South Africa has 89%. The impoverished regions of Sub-Saharan Africa, such as Kenya and Uganda have 83% and 65% ownership of cell phones, respectively (Kaliisa, & Picard, 2017), while Nigeria has 184,699,409 active mobile connections which includes owners with multiple SIMs, as of December 2019, and has a tele density of 96.76% (Nigerian Communications Commission, 2020). In addition, there is a monumental rise in the use of mobile devices by tertiary education students and teachers in Nigeria which is equally spreading to both secondary and primary schools, with the possibility of permitting learning to take place, without location and time constraints, as well as facilitating collaboration (Cochrane et al., 2013; Mojaye, 2015; Eames & Aguayo, 2019). Owing to the potential of mobile devices improving teaching and learning, many countries have deployed them into their educational systems. This deployment has led to what stakeholders in the sector refer to as mobile learning, which is a type of educational experience that occurs with the aid of portable devices like Personal Digital Assistants (PDAs), computer tablets, and smart phones (Giousmpasoglou & Marinakou, 2013; Alwraikat, 2014; Mittal et al., 2020) or learning “on the move” with no classroom restrictions (Brown & Mbati, 2015). Regardless of how it is defined, what is certain is that these devices have the potential to enrich the learning experience. Kizito (2012); Wang (2017); Farrah and

Abu-Dawood (2018) stressed that the application of mobile devices in education, offers positive ideas and benefits that improve learners' motivation that leads to enhanced understanding.

Many studies have investigated the outcome of using mobile devices to support teaching and learning processes (Isaacs, 2012; Khaddage et al., 2012; Rana, 2014; Delen & Krajcik, 2017; Fantacci & Picano, 2020). Huang et al. (2010); Mach and Becvar (2017); Law et al. (2018); Li (2020) claimed that mobile learning applications enable students to study contents in a more convenient way. In addition, they help the students to interact and collaborate with each other at anytime and anywhere, enabling them to overcome their weaknesses and correct their misconceptions.

ICT and education

ICT is becoming increasingly more important in our daily activities, which include teaching and learning. It has long been established that ICT has the potential to empower both teachers and learners, as well as the entire learning environment beyond traditional methods, because it offers flexibility (Simeo et al., 2015; Imhonopi et al., 2017). Its integration into education, promotes comprehension via its interactive, dynamic nature, engaging content, thereby enhancing the learner's understanding towards having meaningful constructs and providing concrete opportunities for individualized instruction (Elfeky & Masadeh, 2016).

The American Association of School Librarians anad the Association for Educational Communications and Technology (1998); Twiss-Brooks et al. (2017); Law et al. (2018) emphasized that students with ICT skills master content in a more efficient manner, and are better equipped to solve problems, more self-motivated, and attain a greater control throughout their learning. To maximize the benefits of ICT in education, teachers need to depart from their traditional ways of imparting knowledge, by embracing innovative changes within their profession.

Teachers' use of ICT in education, is considered as a necessary and important instrument that supports new ways of developing students' skills for searching and accessing information, cooperation, problem solving and lifelong learning, which are important skills for the preparation of children for knowledge-based society (Torres et al., 2015; Peter et al., 2018; Li et al., 2018). This explains why nations via their governments, have continued to invest in ICT, so as to be able to take advantage of the enormous technology benefits for education that will assist in developing their citizens and society.

As technology is evolving, it is challenging the traditional practices in education, by offering better alternative approaches, this makes it necessary to take advantage of the revolution to improve teaching and learning processes. This disruptive technology requires re-evaluation of educational sector,

to make it more responsive to societal needs (Zovko, 2018). Disruptive technology in higher education include collaborative platforms, the internet of things, online learning, artificial intelligence, etc. (Sagenmüller, 2017; Leigh & Goldrick, 2017; Zovko & Gudlin, 2020). These emerging technologies promote effective learning through better engagement of learners, improved access to both learners and learning content and facilitation of collaboration among learners as well as with teachers.

Examples of some countries that have integrated mobile learning into their higher educational programs

Globally, mobile learning has been adopted in a number of higher education institutions. In Australia for instance, the Commonwealth Government, through the National Vocational Education and Training E-learning strategy, introduced the utilization of mobile technologies for learning (Herrick, 2011; Kaliisa et al., 2017). Charles Sturt University has integrated a mobile learning initiative, "Bring Your Own Device" (BYOD), to help improve students' learning (anzMLearn, 2012). In 2011, the Faculty of Sciences at the University of Adelaide, offered iPads to all first-year students to investigate their impact on student learning process (Herrick, 2011). In addition, the School of Distance and Lifelong Learning at Makerere University in Uganda, integrated a Mobile Research Supervision project, that would improve the research capabilities of distance learning students via voice and text collaboration (Muyinda et al., 2009). The Makerere University Mobile application (Makapp) was launched before the introduction of the MobiClass project, which was funded by the Swedish Programme for ICT in developing regions, to foster the use of mobile devices to access the Makerere University learning management system (Makerere University, 2016). All these initiatives have helped the various institutions to enrich their activity goals, by enhancing motivation and the engagement of the learners. In Malaysia, Tze et al. (2014) have introduced their university students to the use of Facebook messenger via their mobile devices to facilitate participation and engagement in their learning activities, as well as enhancing their interest in their subjects' content, significantly. In India, Maria (2016) claimed that she has used WhatsApp to motivate her undergraduate students to help improve their writing skills, and she posited that the internet which is always available on smart phones is a highly motivational tool for them. Andújar-Vaca and Cruz-Martínez (2017) investigated the impact of WhatsApp' potential to develop oral skills via instant mobile messaging and were able to report that significant improvements in terms of proficiency were observed.

In Tanzania, Mwapwele and Roodt (2016) revealed that almost three-quarters of students that were surveyed, had effectively utilized Google on their mobile devices for their studies and 44% of them had used YouTube to connect to various learning activities via their mobile devices.

Song and Siu (2017); Wishart (2018) adopted a project called Bring Your Own Device (BYOD) in Hong Kong which has been utilized both in and outside of classrooms with the aim of facilitating teaching and learning anywhere and anytime. This program helped to eliminate the gap between teachers and students, extending learning beyond conventional classes and allowing teachers to engage larger audiences of learners. The students learning process can be tracked by offering them opportunities to reflect on their studies and collaboration in accessing instructional materials, as well as reviewing and making comments on their peers' work.

Elphick (2018) carried out a pilot program called iPilot, to study students' motivation regarding the use of mobile devices for learning. During the two-year duration of the initiative, iPads were provided to the students, and the study revealed that they improved their access to learning outside of traditional settings.

As part of efforts to prepare the country towards becoming a smart nation, Thai government initiated a programme tagged One Tablet Per Child (OTPC), where android tablet PCs, loaded with subjects including Thai language, science, English language, mathematics, social studies, etc, were distributed to students across all levels of education nationwide to encourage lifelong learning (Ministry of Education, 2011; OECD/UNESCO, 2016; Panjaburee & Srisawasdi, 2018). In addition, Thai universities are consistently reforming their traditional approach of teaching and learning, by embracing online learning procedures. An example of such is "ClassStart" programme developed by Prince of Songkla University. This platform is available, free of charge, to other universities in the country (ClassStart, 2016; Thongsri et al., 2019). This initiative is to assist the country's educational system and to promote student-centered learning, by enabling the users to access educational moments with internet-enabled devices without time and location barriers.

Mobile learning constitutes a powerful tool that provides an educational context that enables learners to ubiquitously negotiate meaning, reflect and evaluate their own performance through authentic interaction and feedback (Hamad, 2017). Once the appropriate factors and processes are provided, mobile learning tools will be indispensable in modern education.

Benefits of mobile learning in higher education

Mobile learning has through its characteristics of flexibility and self-paced learning, extended education to those who naturally would not have had the time to study, due to their daily engagements or dispositions. Self-paced learning can be practiced in different ways, such as accessing online educational materials, participating in education through pre-recorded classroom activities or accessing specific courseware online as directed by your teacher using mobile devices. Mobile learning fosters education through online collaborative learning (Rabah, 2015; Debra & Qua-Enoo, 2018). This collaboration refers to students interacting amongst themselves and their teachers via mobile devices, which can be either asynchronous or synchronous. When learners interact with their peers or teacher at different times is asynchronous, while interactions that are in real time are synchronous. Mobile learning enables students to study while on the move and communicate with their teachers or other students, which provides the support they require.

In addition, mobile learning promotes the building and development of digital skills for lifelong learning that has become increasingly necessary in the competitive knowledge society for both the teachers and the learners alike (Grand-Clement et al., 2017; Brown, 2017). Any educational system that does not equip its students with lifelong learning skills, fails to prepare them adequately for modern society.

There is a paradigm shift in the traditional approach of teaching and learning as a result of globalization, making knowledge and information critical for the modern world. This development has changed the focus of education to be on programmes and approaches that facilitate skills, productivity, and curricula that tends to necessitate access to a vast variety of information and sources, learner-centred approaches oriented with authentic context where the teacher becomes a facilitator, rather than knowledge expert. This new focus is adequately supported by prevailing technologies and the emerging ones that play a greater role in professional development of the teachers and the dissemination of new and better practices to outside communities (Debra & Qua-Enoo, 2018).

The advantages of mobile technology for higher education, includes greater access and more open systems of educational resources and information while eliminating geographical boundaries. Al-Shboul et al. (2017) stated that the main benefits of mobile devices in education are, learners can decide on the locations/times for studying, determine their own pace without delaying others. This helps enhance the students' capabilities to access, retrieve, use, organize, provide information and communicate with their colleagues and teachers alike, without classroom restrictions (Albugami, 2016).

The clamour for mobile learning integration especially in higher education, is to better prepare students for the modern world of work that is dominated by ICT.

Modern day learners are usually described as "digital native" because they are increasingly exposed to digital technology. As a result, higher education is rapidly moving away from traditional practices towards digital approaches, in order to meet the needs of these learners that have grown up with this technology (Barrow et al., 2019) in order to adequately equip them for the constantly changing world where digital skills are progressively becoming necessary.

State of mobile learning in Nigerian higher education

Although this educational tool has not been fully integrated into Nigerian higher education, the initiative was introduced in University of Ibadan on 21st February 2012 (Utulu & Alonge, 2012). The operators of the project extracted students' records from the Management Information System (MIS) division of the distance learning centre, for the purpose of identification and registration. At the commencement of the semester, students were exposed to mobile learning orientation programme. The students were divided into groups and connected to online platforms called 'online tutors.' The students received three modules online for each course during the first week, a module consists of frames and each frame is made up of instructional material as well as questions, that may be multiple choice or those that are designed to elicit short written responses, to assess the students' understanding about a particular information in a frame (Kabir & Kadage, 2017). In addition, the modules have chat features, where students are enabled to engage in collaborative learning with the aid of their mobile devices. The students were evaluated through the mobile platform at the completion of the three modules.

In the same University of Ibadan, a mobile learning initiative, designed and developed through collaboration of various researchers, and financed by Partnership for Higher Education in Africa-Educational Technology Initiative (PHEA-ETI) was also introduced in 2012 (Adedoja et al., 2012). The aim of the project was to enable distance learners have a robust access to contents without restrictions of time and place via mobile devices. During the first phase, four courses were designed on the mobile platform which can be accessed on any internet-enabled mobile device regardless of time and location. The platform also offers the students the opportunity to interact with tutors and collaborate with themselves in learning activities.

In addition, a mobile learning platform was developed for Nnamdi Azikiwe University students by Ogbuju et al. in 2012, and they asserted that the initiative facilitates students' access to contents, submission of assignments and collaboration (Ogbuju et al., 2012; Chaka & Govender, 2014).

Researchers have also studied the feasibility of comprehensively integrating the educational tool in order to enhance the educational experiences of the products. Oyelere et al. (2016) investigated the mobile devices used by Nigerian university students for accessing and interacting with the educational contents, concluded that the undergraduates can use them to effectively enhance their studies. Shaibu et al. (2016) undertook a study to discover students mobile learning experiences in higher education in Nigeria and found that the technology improved the academic achievement of the students. Imhonopi et al. (2017) appraised ICTs as new media tools for language teaching and learning in tertiary institutions in Nigeria and indicated a positive outcome. Olaitan and Olusegun (2017) also analysed the attitude of college students towards mobile phone usage in Nigeria and found that they had a positive disposition towards the use of the technology.

Chaka and Govender (2017) studied the perceptions and readiness of higher education students in Nigeria towards mobile learning, reported that even though it has not been comprehensively implemented, the students expressed their eagerness to embrace it as they are confident that it will improve their learning abilities.

Mobile Edu-puzzle programme was developed for computer science education in Nigeria, as part of measures to shift from traditional classroom approach to a technology powered process, this initiative is made possible by the innovations in games, puzzle-based learning and program visualization (Kazimoglu et al., 2012; Oyelere et al., 2019).

Challenges of integrating mobile learning into Nigerian higher education

Changes in government, poor leadership, incomprehensive policies, poor power supply, the lack of diligent implementation as well as qualified personnel, and the lack of adequate funding are the main factors responsible for poor ICT integration in Nigerian education (Matthew et al., 2015; Adu & Galloway, 2015; Odukoya et al., 2018).

Access to ICT facilities in higher education institutions in Nigeria is low because teachers and students cannot provide the infrastructure upon which mobile learning can flourish. Internet connectivity is expensive unlike in the developed countries where it is almost free of charge for schools (Olayemi, 2019; Apuka & Tunca, 2020). There is also a significant ICT infrastructure gap between educational institutions in both rural and urban areas of Nigeria (Gebremichael & Jackson, 2006; Adomi & Kpangban, 2010; Rivers et al., 2015; Kizito, 2016; Oni & Uko, 2016; Davie, 2017).

Allied with the above is the problem of the supply of electricity which is the bedrock for ICT integration, diffusion and sustainability in all sectors, especially education. Over many years there has

been a persistent challenge with the power supply which is often epileptic and unstable at best (Adomi & Kpangban, 2010; Agyekum & Ossom, 2015).

The required pedagogical competencies to integrate, diffuse and sustain the utilization of ICT in the Nigerian higher education sector is also not available, because most teachers do not have the knowledge of how to utilize it as a teaching and learning tool (John, 2015; UNESCO, 2016; West et al., 2019).

Interestingly, there is hope that the above challenges will soon be addressed as there is a renewed call from all stakeholders to reposition the country's educational sector with a view to making it more responsive to modern day realities.

Conclusion

The portability of mobile devices with their improved capabilities to access learning materials online, enhance collaboration, capture and store significant amounts of information has made them indispensable tools in education. This proves that both teachers and learners' experiences can be enhanced when this technology is integrated into the Nigerian higher education system. In addition, the integration of the emerging technologies in higher education in the country will facilitate the acquisition of digital skills by both the teachers and students, thereby equipping them to better perform their roles in today's society where there is high premium on such skills.

Recommendations

Below are suggestions on how to overcome the above-stated challenges to reposition higher education in Nigeria, with the integration of mobile technology, in order to make it more responsive to modern societal needs.

Educational and ICT stakeholders in Nigeria should as a matter of urgency, come up with more robust, comprehensive and feasible policies that will deeply entrench modern technology into its educational sector, as a means of correcting the existing abnormality in the system.

The government should faithfully depart from lip-service funding to education and give it the desired attention with adequate funding, which will help to revamp the deteriorated existing facilities and upgrade them to meet the requirements of education in the 21st century. Efforts need be made to comply with the UNESCO recommendation of 26% of the total budget of a nation to its educational sector, in order to comprehensively integrate technological innovations that will address the rot within the system.

With the provision of adequate funding, mobile technology can be deployed to improve the access and quality of education. This comprehensive integration into the educational system, will eliminate the challenge of poor standards which has ridiculed the quality of knowledge and skills of the graduates that have passed through these institutions.

Collaborative efforts need be made by the three tiers of governments (federal, state and local governments) to initiate a massive and continuous professional development scheme for teachers, in order to equip them with the required attributes expected in 21st century, as well as overhauling the various training institutions across the country. With these professional developments, teachers will be better equipped to use modern ICT facilities as pedagogical tools. There should be a partnership between schools that are experienced in educational technology and those that are less experienced. Such partnerships will enable the experienced schools to mentor those that are making efforts to integrate innovations into their teaching and learning processes.

The deployment of mobile technology will also help to address the educational activities monitoring problems, by empowering the various agencies that are charged with such responsibilities. Above all, the government needs to expedite action that will provide an adequate electricity supply throughout the country, because it is the bedrock of ICT integration in all sectors of any economy. Even when other challenges are addressed, the lack of a stable power supply in schools, will cause the integration and sustainability of ICT to be a mirage.

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