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Extension of Formal Learning Environment in Higher Institutions in the 21st Century Beyond the Physical Classroom Setting for Social Inclusion: The Perspective of Mobile Learning in Nigeria

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Abstract
The 21st century learning environment needs not to be restricted to the physical classroom in a school setting. Rather, with technological advancement and its application in the educational system, there is need for formal learning contents, principles and methodologies in Nigerian higher institutions to be made mobile for convenience, flexibility, portability and easier accessibility. Therefore, this work centered on extension of formal learning environment in higher institutions in the 21st century beyond the physical classroom setting for social inclusion: The perspective of mobile learning. This piece of work provided detail explanation of mobile learning. The types of mobile learning were also extensively discussed. Further examined herein were the components of mobile learning, importance of mobile learning and the challenges that affect the potentials of mobile learning. Conclusion and suggestions were also offered to tackle the identified challenges of mobile learning.
Keywords: Learning Environment, Higher Institution, Mobile Learning and Social Inclusion.

Introduction

The society is very dynamic; as change remains a very constant phenomenon. As such, the school system; being a vital component of the society must always embrace the changes that occur in the society if it must remain relevant and competitive with other societal components. Therefore, advancement in technological development over the years has left the educational sector with no option than to employ technological innovations in teaching and learning. One such very critical technological innovations which has been utilized in the 21st century in the educational sector in order to extend and expand formal learning environment beyond the classroom setting; thereby promoting social inclusion and enabling the learners to access materials at their convenience and study at their pace is the mobile learning. Beckmann (2010) reported that social learning in a mobile environment enables a learner to compare his/her own conceptions and experiences with those of others which is fundamental to a cognitive engagement with connection between theory and practice.

Taylor, Sharples, Malley, Vavoula and Waycott (2006) cited in Kearney, Schuck, Burden and Aubusson (2012) opined that learning may be more effective when learners learn from each other, share information together, access materials and information freely, study at

their pace and convenience and when the learners are in control of their learning. Zurita and Nussbaum (2004) cited in Jalil, Beer and Crowther (2015also stated that learners enjoy and learn more by being active participants of their learning.

Therefore, the need for the introduction of mobile learning into the educational sector especially in higher institutions is because mobile technology is becoming so prominent in students' lives; as over 50 percent of students currently own a cell phone (Mehta, 2016). In the same vein, Subramanya and Yi (2006) cited in Mehta (2016) observed that because of the proliferation in the use of mobile technologies around the world, there is a significant interest in mobile learning to provide flexibility in learning. Jalil, Beer and Crowther (2015) maintained that in the context of higher education, the need for mobile learning is very critical; as institutions and students have recognized the importance of bridging the gap between formal classroom and out-of-classroom informal learning to achieve pedagogical goals. In the same vein, Sharples (2007) cited in Beckmann (2010)stated that mobile learning is gradually gaining popularity in higher institutions (higher institutions in Nigeria inclusive) because of the increasing availability of low cost mobile and wireless devices as well as the supporting infrastructure and technology; as it provides a new way to extend education outside the fixed classroom; thereby creating learning communities between people on the move, providing expertise on demand and supporting a lifetime of learning.

Conceptualization of Mobile Learning

Different scholars have given different explanations of mobile learning. As the name implies, mobile learning is an aspect of electronic learning that makes use of wireless technologies and computing. Wong (2012) viewed mobile learning "as a personal control and ownership of the learning process for learners". Wong stated that placing the learners at the center of learning in mobile learning does not mean that they are the center of attention of teachers but rather the center of production of knowledge that occurs in various contexts across spaces within their control. Mobile learning setting according to Wong allows the learners to be able to perform and seamlessly switch between multiple learning activities; thereby resulting in knowledge synthesis. Basically, the ownership of mobile device, which integrates all the personal learning tools and resources carried by learners at all the times, enable the learners to manage and share the learning resources that they picked up along their journey to support a learning activity in the future.

Mehta (2016) perceive mobile learning as the ability to obtain or provide educational content on personal pocket devices such as PDAs, smartphones and mobile phones or devices. It simply refers to an e-learning that uses mobile devices and wireless transmission in its delivery of information. It is a learning strategy which occurs with the aid of mobile devices or the use of small, portable, and wireless computing and communication devices. Alexander (2004) cited in Park (2011) defined mobile learning as the learning that takes place via such wireless devices as mobile phones, Personal Digital Assistants (PDAs) or laptop computers.

Thus, any kind of learning that occurs when the learners make use of wireless technologies in any place with the guidance of an instructor is regarded as mobile learning.

Types of Mobile Learning

According to Park (2011) and Spin (2020), there are four types of mobile learning generated in the context of distance education.

1. **High Transactional Distance and Socialized Mobile Learning:** Park (2011) defined high transactional distance and socialized mobile learning as the type of mobile learning which replaces the traditional technology-mediated classroom group activity where students in a group or pair conduct given tasks or assignments. In the view of Spin (2020), for a mobile learning strategy to be regarded as high transactional distance and socialized mobile learning, the following four basic factors or conditions must be involved:

i. When the learners have more psychological and communication space with their instructor or institutional support.
ii. When the learners are involved in group learning or projects where they communicate, negotiate and collaborate with each other.
iii. When learning materials or the rules of activity are delivered from the predetermined program through mobile devices.
iv. When transactions mainly occur among learners and the instructor or teacher has minimal involvement in facilitating the group activity.

2. **High Transactional Distance and Individualized Mobile Learning**: It is the type of mobile learning which is influenced by the context regarding when and where to learn. Thus, high transactional distance and individualized mobile learning is often used to provide students' access to the educational system in rural areas (Jalil, Beer & Crowther, 2015). This type of mobile learning represents an extension of e-learning which allows greater flexibility and portability. Spin (2020) maintained that mobile learning can only be regarded as high transactional distance and individualized mobile learning if:

i. the individual learners have more psychological and communication space with the instructor or instructional support.
ii. When the individual learners receive tightly structured and well-organized contents and resources such as recorded lectures and readings through mobile devices.
iii. When the individual learners receive the content and control their learning process in order to master it. iv.If the interactions mainly occur between the individual learner and the content.

3. **Low Transactional Distance and Socialized Mobile Learning**: It is the type of mobile learning allows individual learners to interact both with the instructor and other learners as they use mobile devices. Therefore, in low transactional distance and socialized mobile learning, the students have less psychological and communication space with

the instructor. It is also characterized by having loosely structured instruction and the students work together in a group as they solve the given problem and try to achieve a common goal. The learners engage in social interaction, negotiation and frequent communication naturally (Spin, 2020).

4. **Low Transactional Distance and Individualized Mobile Learning:** Spin (2020) perceived low transactional distance and individualized mobile learning as a mobile learning type which there is less psychological and communication space between instructor and learner and the learning content is loosely structured and undefined. Kante (2017) reported that in low transactional distance and individualized mobile learning, the individual learners can interact directly with the instructor and the instructor leads and controls the learning in an effort to meet individual learners' needs while maintaining their independence.

Components of Mobile Learning

Jalil, Beer and Crowther (2015) identified the following components of mobile learning.

i. Note: According to Jalil, Beer and Crowther (2015), note as a component of mobile learning allows the learners to save whatever they write into txt files. In the same vein, Petrova (2007) cited in Kante (2017) maintained that with the help of note in mobile learning device, learners can easily save any write-up of theirs. The notes can be opened for reading or editing as well as shared with peers.

ii. Picture: This component enables students/learner to take a new picture as well as retrieve old or saved pictures from gallery and share them with others if need be. In the view of Kante (2017), picture as mobile learning component is vital because students can save pictures and other images for future usage.

iii. Audio: The audio component according to Wong (2012) ensures that the learners can do some recordings as well as play, share and delete audio files. Jalil, Beer and Crowther (2015) stated that the recorded files will be displayed in a list which the latest file is on top; thereby making it easier for usage when the need arises.

iv. Video: With the video component, learners can capture, play, share and also delete video files. The recorded videos will be displayed in a list which the latest file is on top (Jalil, Beer& Crowther, 2015). With the help of video component, students can call and see themselves or their lecturers.

v. Email: This is one of the vital components of mobile learning; as it makes communication, teaching and exchange of learning contents. Lecturers can use this component to give assignments to the learners. Relevant learning materials can be downloaded and sent as attachment to the learners. Through email, the students can as well use it to submit assignments (Mehta, 2016).

vi. Chat: With the help of chat, two or more students/learners can establish a real-time chat session whereby one of them is acting as a server and the other is a client (Jalil, Beer &

Crowther, 2015). Through chat component of mobile learning, students can engage themselves in learning interaction; thereby sharing ideas and opinion of challenging topical issues.

vii. Reader: Heng, Sangodiah and Ahmad (2015) observed that mobile learning would have been ineffective without having the reader component. Reader as the name implies is basically meant to help student users read any file that has been saved much earlier. Thus, reader is used for reading saved files.

viii. Browser: Mobile learning, being technology-based, has browser as a useful component. With the browser, students can easily access a web page by typing the keyword in the search textbox (Jalil, Beer & Crowther, 2015). Kante (2017) stated that the browser ensures that students can search for any information of their choice with ease and speed.

ix. Calculator: Anticipating that some courses may involve calculations, mobile learning is designed in a way that it has standard calculator in it. With help of this component, learners can easily make use of it for mathematical works other calculations (Wong, 2012).

x. Twitter: According to Kante (2017), in order to facilitate free and easy communication and interaction among the learners and or their teachers, mobile learning has a twitter component. Jalil, Beer and Crowther2015) maintained that twitter allows learners to post and share their thoughts with communities of interest.

xi. Texting: Texting as mobile learning component is very useful to the learners especially students. Jalil, Beer and Crowther (2015) stated that texting assists a learner to type messages and send them to other learners individually or by group. The learner can also add or remove a member's phone contact number.

xii. Map: Mehta (2016) reported that map is a vital component of mobile learning; as it is useful in determining location. In the view of Jalil, Beer and Crowther (2015), map enables learners to navigate within a location. It also helps students to save the location that is interesting to them for future use.

Importance of Mobile Learning to Higher Institutions of Learning

The utilization of mobile learning in higher institutions has enormous benefits. Generally, Norris and Soloway (2004) cited in Heng, Sangodiah and Ahmad (2015) maintained that mobile learning increases students' motivation, collaboration and document sharing, instant feedback, learning-in-context, managing multiple resources, students' assessment of studies, progress monitoring, parent involvement and communication. Mobile learning allows for guided discussions, team activities among others. Other benefits of using mobile learning in higher institution include:

i. Enhanced Communication: Mobile learning allows for fast communication; as the community of learners does not depend on geographical proximity or physical classroom. Laurillard (2002) cited in Jalil, Beer and Crowther (2015) similarly demonstrated that mobile learning provides the environment for communication in which conversational learning takes

place for a group of learners. Thus, communication and collaboration lie at the heart of an effective pedagogy for mobile learning environments. Communication can lead to deeper knowledge as learners can discuss, analyze and work together with other learners on a specific learning activity to start intensive reflective process. In this way, they can help their team-mates and identify their own knowledge gaps to have better reflection and guidance in their learning and achieve the targeted learning goals. Heng, Sangodiah and Ahmad (2012) mentioned that in order to provide a better quality of teaching and learning for mobile environment, features that connect the learners to their learning community at any given time and location such as instant messaging must be provided as they enjoy that mechanism in interaction. The interactions do not only involve other people such as family, friends, colleagues but also strangers and people from the media who are not directly involved in the learning.

ii. Flexibility in Learning: Vasiliou and Economides (2007) cited in Heng, Sangodiah and Ahmad (2015) maintained that the integration of mobile devices, wireless communication and networking technologies into the education environment could enhance the learning; as it enables the teacher and students to utilize computing power anytime and anywhere.

iii. Easy Accessibility of Information: The utilization of mobile learning in higher institution enhances availability and accessibility of information by both students and the teachers. It also has the capacity to increase students' motivation and learning outcome. Teachers could monitor web-based learning activities as well as help learners to efficiently promote learning interests and performance (Vasiliou |& Economides, 2007 cited in Heng, Sangodiah & Ahmad, 2015). In the same direction, Norris and Soloway (2004) cited in Heng, Sangodiah and Ahmad (2015) admitted that mobile learning promotes students' access to information anytime, anywhere and from arbitrary device.

Mobile learning is very useful in education as; it allows learners to interact with each other and with their teachers. Tablets holding notes and e-books are lighter and less bulky than bags full of files, paper and textbooks or even laptops. It makes it much easier and possible for users to share assignments and work collaboratively; as learners and teachers cane-mail, cut, copy and paste text, pass the device around a group. The learning strategy can be used anywhere, anytime, including at home, on the train, in hotels. It also engages learners who may have lost interest in education. It contributes to combating digital divide; as the equipment are relatively cheaper than desktop computers. It allows learners to access lessons, video clips and audio libraries from anywhere, including public

Places, moving buses and trains. Interaction with fellow students and instructors is highly facilitated. Since learning is made easier when information is shared and questions answered through asort of combined study, mobile learning helps several students to work together on assignments even while remaining at far-flung locations (Mehta, 2016).

Challenges of Mobile Learning

Irrespective of the diverse benefits of mobile learning and its devices to students and lecturers/teachers, several factors tend to inhibit its full potentials.

1. Short life span of mobile learning devices: Mehta(2016) maintained that since mobile learning devices require power supply for the batteries to be charged and used, lack of constant power supply could hinder the use of mobile learning devices and data can be lost if small mobile and Personal Digital Assistant (PDA) batteries are not correctly and properly charged. Wong (2012) reported that the short battery life span and frequent changes of batteries is a great nuisance and the absence of a common hardware platform; makes it extremely difficult to develop content for use by all.

2. Lack of technological expertise by the users: Xia, Asabere, Ahmed, Li and Kong (2013) observed that despite the enormous benefits of mobile learning, a whole lot of teachers and students especially in developing and underdeveloped nations lack the technical know-how on the utilization of the technology-based learning strategy. Xia etal added that some teachers are not computer compliant; let alone making adequate use of mobile learning devices.

3. Negative Implications: In as much as mobile learning facilitate teaching and learning, Mehta (2016) stated that some mobile devices may contribute to unethical behavior by students or distraction. Rather than using smart phone to serve educational needs, learners may engage in constant chatting of their peers and visiting sites that may not promote morality and learning. Constant usage of mobile devices may also compromise the physical health of the students especially damaging the eyes.

4. Perception by parents and teachers: Ally (2013) submitted that some teachers and parents currently consider cell phones to be a huge distraction to students in school; as many tertiary students in developing and under developed countries do not have android phones. Some parents are more particular about the negative implication of using android phones at the expense of the benefits; thereby hindering them from providing cell phones to their children which could help in the application of mobile learning.

Conclusion

As a result of technological advancement in the society, there is a growing recognition that information and communications technology plays very significant role in supporting teaching and learning in higher institutions in Nigeria and beyond. Thus, application of mobile learningin higher institutions has the capacity to facilitate human interaction, promote easier access to information anytime and anywhere. Hence, for the purpose of convenience, portability of learning contents and accessibility of information anytime and anywhere, higher institutions should explore and employ mobile learning in Nigeria and beyond.

Suggestions

1. Since small mobile and Personal Digital Assistant (PDA) batteries need to be fully charged for effective utilization of mobile learning, adequate power supply should be provided for users/students.

2. Before adopting mobile learning strategy in higher institutions, school management should ensure that both lecturers and students properly trained and retrained on how to make use of the strategy.
3. Since android phone is needed in the utilization of mobile learning, parents should be enlightened on the need to embrace the strategy by providing android phones for their children and or wards.
4. Students/users should be enlightened on the need to avoid using their mobile phones meant for learning to engage in unhealthy practices.

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