

OPPORTUNITIES AND CHALLENGES OF TECHNOLOGICAL UTILIZATION IN TEACHER EDUCATION, INSTITUTION AND MANAGEMENT, IN THE DIGITAL ERA

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Abstract

The evolutions in the current digital world have paved way for the fast-tracking of improvement in the teacher education, institution and management. This has equally yielded the acquisition of necessary teaching skills and strategies in the teaching and learning environment. This development which has provided several opportunities is however, not without its challenges. The digital trend has brought opportunities to the teacher education, management and institution in areas encompassing mobile technology, blended learning, and/or cloud-computing. The fulcrum of this paper therefore, was to critically examine the various concept areas that the teacher education, institution and management have benefited in the digital economy such as mobile digital learning, administration, teacher education institutions as well as the opportunities and challenges of utilizing the mobile digital learning. Based on these, it was recommended that the government through the ministry of education should provide adequately to teacher education institutions, the needed mobile technological devices for effective utilization, administration and management of the teacher education institutions.

Keywords: Digital Learning, Administration, Teacher Education, Teacher Education Institutions, Opportunities, Challenges.

Introduction

It is the duty of the teacher education institutions to train teachers globally both at the in-service and pre-service levels so as to ensure adequate acquisition of relevant teaching skills and strategies for the actual implementation of teaching and learning in the educational environment. The pre-service and in-service teachers training is performed by teacher-educators who equally serve as administrators in the teacher education institutions. The conventional methods of instruction and administration have been utilized by the academic administrators for the effective management of teacher education institutions but observations have shown that advancements in technological trends in education and other fields of endeavor, digital innovative trends are more effective in enhancing the quality and easy-flow of administrative roles in teacher education institutions. Some of the digital innovative trends that are being utilized among others include mobile technology, blended learning, e-learning, and so on. These digital innovative trends have their opportunities and challenges in the administration of teacher education and institutions. This paper therefore sought to focus on utilization of technology, in the teacher education, institutions and management as well as opportunities/benefits and challenges of mobile technology utilization in administration of teacher education institutions in this digital era/economy.

Concept of Mobile Digital Learning

Mobile technology is a concept that has been given various meanings by educational and instructional technologists. According to Vijayalakshmi (2018), mobile technologies are portable devices that are carried about and used in performing a wide variety of tasks. The

portable devices encompasses cellular phone, Personal Digital Assistants (PDA) tablet, laptops, among others. Mobile technology equally includes the use of a variety of transmission media such as: radio wave, microwave, infra-red, Global Positioning System (GPS) and Bluetooth to allow for the transfer of data via voice, text, video, two-dimensional barcodes and more.

However mobile technologies such as mobile phones connect to a wireless communications network through radio wave or satellite transmissions. Most mobile technological devices such as mobile phones and iPads, provide voice communications, Short Message Service (SMS), Multimedia Message Service (MMS), games, cameras, video players, navigational systems, and also provide internet services such as web browsing and e-mail which help in dissemination of information needed in the learning environment of the teacher education institution. They can be used over a wide area without a physical connection to a network. From the above discussions, one can assert that mobile technologies are hand-held technological devices used in accessing information flexibly at anytime irrespective of pace of learning by learners, location and space. Four different communication technologies exist, which are used in ensuring the viability of mobile devices. They include General Packet Radio Service (GPRS), Wireless (Wi-Fi), Bluetooth and Infrared. These communication technologies are available in some mobile devices. The mobile devices that do not have these technologies are supplied with communication ability by using one of the transferring technologies such as USB, Compact Flash Card and PC Card transferring technologies such as USB, Compact Flash Card and PC Card PCMCIA). Wi-Fi, which is mostly preferred in mobile devices, is a technology that provides devices such as personal computers, play stations and digital audio players with wireless internet. Moreover, the other technology that increases the applications and efficiency in mobile devices is Augmented Reality (AR). AR technology, which has developed in a very short time, has proved to be very innovative and efficient technology in order to solve some kinds of problems. This AR technology can be used in smart phones (Android, iPhone), tablet PCs, (Android, iPad), desktops and internet-based applications. The AR technology is therefore used actively in mobile applications in order to bring different approaches in learning. Conventionally, orientation education, which in an educational setting, entails a programme for new students at the beginning of their time at an institution, (helping them to understand the school policies, resources, academic expectations, and campus culture) are given by tour guides or they are given on line. However, these methods do not erect conscious learning. With the AR technology, the mobile learning carried out by means of smart phones that include video camera and internet connection or through a GPS technology makes learning conscious, easy and unlimited. The AR technology is a very important technology in terms of being user-centered, visualizing the processes it does and providing real-time feedback in the educational environment/institution. This technology arouses interest among learners and reinforces leaning (Chou, and ChanLin, 2018). The Mobile Cloud Computing (MCC) technology is a kind of service that provides common data sharing among the data processing devices through its performance to deliver data online. It provides a wide range of opportunities for mobile service sector by making computing resources available in mobile devices on a data network. Mobile learning devices and technologies instantly enables interaction between the learners and the teachers, among classmates or with learning systems. It is equally a good opportunity provided for the learning environment. The learning devices are able to be used intensively in managerial and educational processes in many associations, and they also play an important role in developing interaction within the classes or outside the classes in educational institutions. Ericson, being one of the leading communication technology companies in the world, estimates in the report published in 2012 that the number of people using mobile devices will exceed 4 billion in 2018

(Ericsson, 2012). Along with the developments in information technologies, wireless communication and mobile devices in use in order to support the traditional learning (Wang, Liu, Chou, Liang, Chan & Yang, 2017). Wireless communication techniques may help teacher-educators obtain the necessary information on the administrative issues of teacher education institutions. In addition, teacher-educators can direct pre-service and in-service teachers in teacher education institutions to the information by using these techniques. Therefore, teacher-educators as administrators can use their mobiles or PDAs (Personal Digital Assistant) in order to access the information they need (Robbert, 2019). In the contemporary time, it is possible to outline the mobile devices used in mobile learning as the following:

- a. **Smart Phone:** It is a kind of communication device that has been designed by adding the features of PDA. Due to the fact that smart phones have mobile operating system and many applications, they are very common devices used actively in all areas for different purposes. These mobile devices are being used by administrators in teacher education institutions in order to achieve the set objectives.
- b. **Tablet PC:** Tablet PC is the most popular computer of our time which is a portable personal computer typically smaller than a notebook computer but larger than a smart phone, and it is easy to transfer the data by means of its internet and memory device. It is a kind of computer usually having 7 or 10.1 inch-touch screen.
- c. **PDA (Personal Digital Assistant):** Personal Digital Assistant, also known as palmtop computer, is a mobile device that functions as a personal information manager such as keeping addresses or names. It has the ability to connect to the internet and, it is also portable. With the developments in electronics and computer technology, the size of computers has become small and features of them have increased. The production of computers having the features of camera, video and GPS have expanded, but it has also started to give its place to smart phones.
- d. **Laptop:** Laptops are some of the portable devices that are mostly used in our daily life. Laptops can have all the properties of a normal PC. Due to its mode of production through advanced technological means, as well as its in-built valuable contents, and their difficulty during installation, their cost is quite high. Laptops enable users to obtain the information they want by means of such wireless connection types as USB, wireless network, Bluetooth and infrared devices independent from time and place.

Concept of Administration

The concept of administration simply describes the activities that are performed in order to plan, organize and run a business, school or other institutions (John, 2016). The school administrator therefore ensures adequate planning, organizing, directing and managing the school through the use of specific managerial skills in order to achieve the pre-defined instructional and educational goals. The pre-defined instructional and educational goals can now be facilitated through digitalization process such as: keeping digitalized custody of personal record, creating digital platforms for personnel, keeping digitalized accounting records, etc. All these are achieved by teacher-educators in the teacher education institutions.

Concept of Teacher Education Institutions

Teacher education is an education that is planned to equip the prospective teachers with the needed skill and knowledge to efficiently impart knowledge on the learners. It is the professional education of teachers that equips them with the right attitudes, skills and knowledge which will make them to embark on their responsibilities efficiently and effectively, focusing on the needs and aspirations of the society at any time. Teacher education embraces the preparation of would-be teachers, as well as those already in the system, for acquisition and updating of skills and knowledge, for effective instruction (Okoro, 2015). Supporting the

above views, Mkpa (2015) posited that teacher education involves the procedures designed to equip teacher both at the pre-service and in-service level with the knowledge, attitudes, skills and competencies which they need to perform their professional duties successfully as teachers wherever they may find themselves. However, the prospective teacher, pre-service teacher or intending teacher or aspirant teacher is provided the opportunity to develop cognitive perspective, through the processes involved in teacher education (Ipaye, in Mkpa & Okoro, 2015). It is the belief of Okoro and Ali-Okoro (2017), that teacher education is an educational programme that is designed and prepared formally and systematically to involve the process of equipping teachers (pre-service and in-service) with the necessary professional tips, skills, attitudes, educational reforms, innovation and knowledge needed for upgrading them to carry out their professional duties and responsibilities in the teaching and learning environment. Teacher education is also the process of equipping the would-be teachers and those already in the service, with the necessary qualities, capabilities and capacities for effective administration of the content of the curriculum. Therefore, it systematically prepares the would-be teachers for the anticipated teaching task ahead (Okoro, 2018). There is no doubt that from the above deductions, the teacher education can be construed as the professional educational programme designed following systematic procedures, processes and formal ethics of preparing, equipping, updating and upgrading pre-service and in-service teachers. In other words, teacher education can be said to be the making of provision for deficient teacher-educators with the required innovative skills, knowledge and attitudes as well as innovative professional and educational reforms for adequate implementation or execution of professional duties in the teaching and learning environment. The various ICT tools now assist the teacher by facilitating learning in different forms. The teacher can now organize virtual class through use of ICT tools such as mobile phones. He/she can equally organize discussion classes and request for the opinion of his/her students through zoom meetings, etc.

Based on the afore-said, the teacher education can be classified as follows:

- a) **Pre-Service Teacher Education:** The pre-service teacher education can be said to be the training and preparation of would-be teachers for acquisition of genuine knowledge, skills and attitudes in relation to contents of the curriculum (Okoro, 2018). It also involves the methods of imparting the contents, as well as professional expectations of teachers who help to shape the future of citizens of the nation.
- b) **In-Service Teacher Education.** This is classified as the continuity in the training of teachers because the teachers here have already received pre-service education. These teachers continue to receive the training while they are on their job of teaching (Okoro, 2018). This is among the efforts geared towards improvement of quality education. Teacher education activities are structured to equip teachers for effective performance of their duties.

The teacher education takes place in an official setting called teacher education institution. Therefore, teacher education institutions are those institutions where teacher education takes place. It can equally be said to be the place where teacher education activities are arranged sequentially, planned and organized by institutional administrators for the production of professional and competent teachers. The following educational institutions were authorized by the Federal Republic of Nigeria in 2013 to give required professional retraining for continuity in meeting the required minimum standards:

- Colleges of Education
- Faculties of Education in Universities
- Institutes of Education,
- National Teacher Institute,
- School of Education in the Polytechnics,

- National Institute for Nigerian Languages,
- National Mathematical Centres, (P.40).

It is pertinent to examine other opportunities/benefits created by the mobile technology as well as its challenges in the administration of teacher education institutions.

Other Opportunities/Benefits and challenges in Utilizing Mobile Technologies in the Administration of Teacher Education Institutions

In the words of Sharples (2016), the following are the issues in utilizing mobile technologies in the administration of teacher education institutions:

1. **Recording of Experiences under Tension with Privacy/Security Issues:** The newly advanced mobile technological devices allow institutional administrators to develop full digital records of teacher-educators', non-academic staff and learners' lives and experiences. Through the utilization of mobile technological devices, institutional administrators may impinge on both the actual enjoyment of those experiences in the first place, and on the rights of others to have their experiences without being recorded or observed by others. In addition, the security and privacy of teacher-educators', non-academic staff and learners' own experiences need to be understood, taken into consideration and respected by the institutional administrators.
2. **How Physical Device /characteristics affect the Interferences:** A mobile phone maybe small and light but, usually has poor capability at recording video. It requires detailed cooperation from participants to get something acceptable. This clearly causes interference in a negative way. However, sharing a mobile photo on the screen is often adequate, and can enhance an experience for many. The drift towards ubiquitous computing (computers available everywhere, embedded in everyday devices) does not remove this issue, but does alter its impact.
3. **Social Issues:** Interference always affects the administration of teacher education institutions through the utilization of mobile technological devices. In particular, there can be enhanced feelings of inclusion or exclusion within a group of teacher-educators, non-academic staff and learners in terms of using a mobile phone to see a photo, academic documents, among others. Technical capabilities and familiarity come into this, but more obvious are the social implications where tribal discriminations or preference (that is where administrators may discriminate or make preference against the educators based on their tribes or social affinities) may occur. Technology in general tends to be much like marmite, in that people either love it or loathe it – very few are neutral about it in the administration of teacher education institutions.
4. **Trust and Affordance are Imposed on Technologies:** There have been sets of reasonable ideas on the level or extent on how much teacher-educators, non-academic staff, learners as well as administrators can be trusted and interacted with; however, technological intervention can alter our perceptions, in that people are opened up to more external influences than the immediate environmental experience, and our experiences of technology vary wildly so that people have different expectations of it in the administration of teacher education institutions.
5. **Perceptions of Learning Conflict with Personal Choices and Freedoms:** Many scholars see learning as what a learner does in school, and therefore, not seen as a personal choice or a freedom. Through the utilization of mobile technological devices, mobile learning supports people, especially the institutional administrators, in the activities in which they willingly participate, and can enhance their enjoyment of these for their teacher-educators as well as non-teacher-educators and learners. It is highly pertinent to ensure that there is high level of understanding more about the roles of

technology in supporting the interactions between formal and informal learning in the administration of teacher education institutions.,

6. **Attention Aspects:** Design and working in real spaces all impact the roles and use of technology. If we are out and about, we may well be in new, often uncontrolled environments, in which we need more basic situational awareness and alertness in order to navigate it, survive it, or appreciate it (depending on the situation). Having to change a focus of attention from the 'real world' to a specific device can be problematic.

7. **Technology can Deskill Users, with Old and new Skills Interfering:**

Technology can provide administrators with so much assistance that they forget how to do things for themselves: why remember anything if you can look it upon Google, for example? This is not often a wholly good thing, and sometimes a very bad one. Carefulness is highly required while designing learning experiences with technology that enhances learning (in whatever shape or form we are considering) rather than simply making it easier for people to do something. In addition, old skills and new ones can interfere with each other. For example, the desktop metaphor was a useful construct in moving people from their paper-based offices towards understanding and using computers. However, for many people, especially the younger ones (who were born in the technological age), their acquaintance with technology is more than that of filing cabinets.

The 21st Century youth: In recent times, modern children possess different perceptions of technology than older people. they re-appropriate it for their own uses and have different expectations of it. it is an integral part of their everyday world. These social, psychological experiential and technical differences are often not fully understood, and even more rarely utilized, by existing or proposed systems, and yet they need to be if the system are to have more significant impact among the administrators in teacher education institutions.

The following among others, as opined by Prokofyeva and Boltunova (2018) are the benefits of applying mobile technologies in the administration of teacher education institutions.

1. **Expanding Opportunities and Ensuring Equal Access to Education:** Nowadays, mobile technologies are universally used even where there are not enough schools, books and computers. The prices for mobile phones are constantly decreasing, so an increasing number of people, even in the poorest regions, have the opportunity to purchase such devices and know how to use them. A growing number of projects indicate that mobile technology is an excellent teaching and learning tool for teacher-educators and students who are deprived of the opportunity to receive quality education in the administration of teacher education institutions. Thus, the Bridge – IT project for Latin America and Asia, which is based on the research approach to learning, provides modern teaching materials. The project is aimed at geographically isolated educational institutions and is implemented through mobile communication. With its help, even educational institutions that are not connected to a fixed telephone network receive Internet access (UNESKA , 2018).

2. **Learning Personalization:**

Mobile devices usually are a property of their owners. They are also at their disposal throughout the day and have many customization features. That is why mobile technologies provide more opportunities for personalization when compared with stationary and information exchange technologies in administering teacher education institutions. Depending on the skills and knowledge of the user, applications for mobile phones and tablets allow choosing texts that are more difficult or easier to read. This approach allows eliminating the constraints faced by students with a higher or, conversely, lowering level of knowledge compared to the rest of the class. Although these capabilities were implemented on personal computers several years ago, their use

had serious limitations. Students did not have the opportunity to freely bring a personal computer to the classroom or take it home, many could not even afford to buy such a device, so this technology even if available in computer centers and specialized laboratories, did not become truly personalized. Due to its exceptional portability and relative cheapness, mobile technologies have greatly expanded the potential and opportunities for personalized learning (Golitsyna & Polovnikova, 2011). With the help of mobile devices education becomes informal, personalized and situated (UNESCO, 2018).

3. **Instant Feedback and Evaluation of Learning Results**

Mobile technology accelerates the process of evaluating learning results and gives students and teachers the opportunity to track progress quickly. Previously, students had to wait days or even weeks for recommendations based on their knowledge. High acknowledgements are given to interactive functions of mobile devices as the answers can be obtained almost instantly. This allows students to quickly identify problems in learning process and repeat the key concepts. The use of mobile technologies increases the efficiency of teacher-educators' works – through automation of the processes of distribution, collection, analysis and documentation of the evaluation data. Therefore, these are mobile applications, which allow teacher=education to quickly assess the knowledge of students, checking their fulfilled tasks for reading texts in teacher education institutions.

4. **Learning at Anytime and Anywhere**

Since most of the time the mobile device is close to its owner, it allows to conduct the teaching –learning process at any time and in any place. The application of mobile learning gives the user a choice: user can perform an exercise that requires several minutes, or completely concentrate on the task for several hours. M-learning can deliver information from anywhere in the world for the teacher–educators and the students. It can be supplied anywhere in the world ensuring that students are satisfied in their learning, and that any problems arising from their study can be dealt effectively in teacher education institutions (Golitsyna and Polovnikova, 2011).

Other benefits as opined by Elias (2011); Crescente and Lee (2011) are as follows:

1. Relatively less pensive opportunities, as the cost of mobile devices are significantly less than PCs and laptops.
2. Multimedia content delivery and creation options
3. Continuous and situated learning support\decrease in training costs
4. Decrease in training costs
5. Potentially a more rewarding leaning experience
6. Improving levels of literacy, numeracy, and participation in education amongst young adults.
7. Using communication features of a mobile phone as part of a larger learning activity, eg.: sending media or texts into a central portfolio, or exporting audio files from a learning platform to your phone.

The following among others, as opined by Mehdipour and Zeehkafi (2013) are the challenges of mobile technologies in the administration of teacher education institutions:

Technical Challenges

Some of the technical challenges can include the following:

1. Connectivity and battery life

2. Screen size and keysize (Maniar, Benneth, Hand and Allan, 2008)
3. Meeting required bandwidth for nonstop/fast streaming
4. Number of file/asset formats supported by a specific device
5. Security and copyright issues.
6. Multiple standards, multiple screen sizes, multiple operating systems.
7. Reworking existing E-learning materials for mobile platforms
8. Limited memory (Elias, 2011).

Social and Educational Challenges

Accessibility and cost barriers for end users: Digital divide

1. Assessing learning outside the classroom
2. Supporting learning across many contexts
3. Content's security or pirating issues
4. Frequent changes in device models/technologies/functionality etc.
5. Developing an appropriate theory of learning for the mobile age
6. Conceptual differences between E-learning and M=learning
7. Design of technology to support a lifetime of learning (Sharples, 2000; Moore, 2009).
8. Tracking of results and proper use of this information
9. No restriction on leaning timetable
10. Personal and private information and content
11. No demographic boundary
12. Disruption of students' personal and academic lives (Masters, K: Ng'ambi D., 2007).
13. Access to and use of the technology in developing countries.
14. Risk of distraction (Crescente & Lee, 2011).

Apart from the afore-listed challenges, there can be other challenges to the use of mobile learning which may include the high costs associated with equipment, connectivity, maintenance, technical support and teacher training; health-related issues; a lack of policy support and governmental investment; and/or a lack of interest and awareness from the part of policymakers and the public; and negative social attitudes that may perceive mobile phones as disruptive devices that students use primarily to play games, chat with friends and potentially engage in inappropriate behaviours such as cheating and cyber-bullying instead of concentrating in their studies.

Recommendations

In view of the challenges and benefit raised in this opinion paper, the following recommendations are made:

1. Chief administrators of teacher education institutions should encourage their academic and non-academic staff to attend workshops, seminars and conferences for the upgrade of their knowledge on technical operation and utilization of the mobile technological devices for adequate and effective discharge of administrative roles in teacher education institutions.
2. Prompt payment of salaries should be made available regularly to teacher-educators and administrators as well as teacher education institutions management in order to ensure individualized practice on the utilization of mobile technological devices.
3. The administrators and management authorities of teacher education institutions should endeavor to encourage their teacher educators as well as administrators to embrace and integrate adversely and adequately the mobile technological devices for effective administration of teacher education institutions around them.

4. The government in collaboration with ministries of education should provide adequately to teacher education institutions the necessary mobile technological devices for effective utilization, administration and management of the teacher education institution.
5. Workshops, seminars and conferences upon the utilization of mobile technological devices for management and administration of teacher education institutions should be organized for teacher educators, administrators and tertiary education managers by academic professional bodies that are ICT-compliant for effective and efficient administration of teacher education institutions.

Conclusion

There is no doubt that mobile technological devices assist greatly in the administration of teacher education institutions through various forms including the use of digitalized palmtops, smart-phones, PDAs tablets PCs, android phones, iPads, among others. They also help in standardizing the terrains of teacher education institutions' skillful training of teachers and development of pre-service and in-service teachers in order to ensure maximal attainment of pre-defined and determined aims and objectives. It is equally not in doubt that total globalization that has been experienced today also motivates institutional administrators to maximize the potentials of their teacher-educators thereby organizing and sponsoring conferences, workshops and seminars for the teachers' knowledge update. As mobile learning is equally seen as a facilitating tool to the human endeavours and the teacher education in particular. It encourages the facilitation of teaching process thereby assisting the work of the teacher and that of the teacher education institutions. It is however, not without its attendant challenges.

References

- Ashby, M. (2010). *An introduction to administration*. United Kingdom: Oxford University Press.
- Chou, T.L., & ChanLin, L.J (2018). Augmented reality smartphone environment orientation application: A Case study of Fu-Jen University mobile campus touring system, *Precedia – Social and Behavioural Sciences*, 46, 410-416
- Crescent, M. L. & Lee, D. (2011). *Journal of Chinese Institute of Industrial Engineers*, 28(2), 111-123.
- Elias, T. (2011). Universotal instructional design principles for mobile learning. *International Review of Research in Open and Distance Learning*, 12(2), 143-156.
- Ericsson, (2012). Ericson mobility report (Online), Retrieved on January 2020, from <http://www.ericsson.com/res/docs/2012/ericssonmobility-report-november-2012.pdf>.
- Federal Republic of Nigeria (2014). *National policy on education*. Lagos: NERDC Press.
- Golitsyna, I., Polvnikova, N. (2011). Mobile leaerning as a new technology in education. *International Electronic Journal of Educational Technology & Society*, 14(1), 241-252.
- Maniar, N., Bennett, E., Hand, S. & Alan, G. (2008). The effect of mobile phone screen size on video based learning *Journal of Software*, 3(4), 51-61,
- Masters, K. & Ng'ambi D. (2007). After the broadcast: disrupting-health sciences' students' lives with SMS. *Proceedings of IADIS International Conference Mobile Learning. Lisbon, Portugal. Pp. 171-175.*
- Mehdipour, Y. & Zerehkafi, H. (2013). Mobile learning for education: Benefits and challenges. *International Journal of Computational Engineering Research*, 3(6), 93-101.
- Mkpa, M.A. (2015). Teacher education in the 21st century: challenges and way forward. In M.A. Mkpa & I.F. Okoro (Eds.), *Fundamentals of Teacher Education*. Owerri: Fylann Limited. 5(4), 87-99.

- Moore, J. (2009). A portable document search engine to support off-line mobile learning. *Proceedings of IADIS International Conference Mobile Learning*. 33-45.
- Okoro, I.F. & Ali-Okoro, O.C.M. (2017). E-learning: A necessity in teacher education for sustainable development. *Proceedings of Nigeria Academy of Education*. 301-312.
- Okoro, I.F. (2018). Implementing home economics curriculum at teacher education level. In T.N. Kanno and U.M. Nzewi (eds). *Issues in curriculum development and implementation in Nigeria (419-430)*. Lagos: Foremost Educational Services Ltd. 3(2), 191-205.
- Okoro, I.F. (2015). Teacher education: Concept and goals. M.A. Mkpa and I.F. Okoro (Eds.) *fundamentals of teacher education*. Owerri: Fylann Limited.
- Prokofyeva, N. & Boltunova, V. (2017). *The use of mobile technologies in the educational process*. Lativa: Riga Technical University Press. 511-515.
- Robberts, P. (2019). Technological interactions between learners and teachers. *Journal of Educaton*, 5(2), 219-21
- Sharples, M. (2016). *Big issues in mobile learning 2nd ed* Nottingham: university of Nottingham Press. 331-343.
- UNESCO (2018). Policy guidelines for mobile learning, <http://iite.unesco.org/pics/publications/ru/files/3214738.pdf>. Accessed 2019/08/25.
- Vijayalakshmi, M. (2018). Meaning and definition of mobile technologies – Use of smart phones. *Scholarly Research Journal for Humanity Science & English Language*, 2(3), 123-129.
- Wang, C., Liu, B., Horng, J., & chen, G. (2017), using mobile techniques in improving information awareness to promote learning performance, p. 106, Third IEEE *International Conference on Advanced learning Technologies (ICALT03)*.
- Wang, H.Y., Liu, T.C. Chou, C.Y. Liang, J.K., Chan, T.W., & Yang, S. (2017). A framework of three learning activity levels for enhancing g the usability and feasibility of wireless learning environments, *Journal of Educational Computing Research*, 30(4), 81-95.