

Contemporary Approaches and Challenges in Education: An Implication in the Use of Mobile Technologies in the New normal

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Abstract

Globally, COVID-19 pandemic which spread worldwide, affecting many aspects of life, does not excepted the educational industry. Hence, teachers are required to prepare for education necessities, decisions, choices, and adaptations to meet student expectations, teacher education requirements, and as well the conditions under which universities and schools operates. The substantive situation thus raises the importance of technology integration in educational system for effective teaching & learning process. Notably before now educational provisions at all levels have been bedevilled with numerous challenges which demands new approaches especially at this post-covid period. It has been envisaged that, the use of mobile technology in this new-normal will go a long way to reduces inherent challenges and improve on the instructional process for students and this is so because the 21st Century students are digital native. The mode anchored on the generic umbrella of Information and Communication Technology (ICT), which is helpful in making the process of teaching & learning more meaningful. It was on this premises that, the paper examined some typologies of mobile technologies devices and their instructional uses, such as: Smart phones, E-book reader, Personal Digital Assistance (PDA) among others. Similarly, challenges associated with their uses were identified and they include: Inadequacy of facilities and resources; Swift switch to online learning; Gap in teachers' skills & competency in handling collaborative learning; Poor infrastructure; Poor internet connectivity etc. The Paper equally identified measures to improve on the uses of mobile technologies for instructional process. Finally, conclusion and recommendations were highlighted and such recommendations made are: Need for adequate funding of education, Provision of adequate infrastructural facilities, provides induction training to improve on skill & competency gap in teachers and ensure good connectivity & provision of the needed internet sources within the school system

Keywords: Contemporary, Challenges, Education, Implication, Mobile Technologies & New normal

Introduction

The global COVID-19 pandemic has spread worldwide, affecting many aspects of life, which educational sector was not excepted and its consequential impact forcing a re-think by the educational policy makers and implementers and as well the teachers & the students in respect to teaching and learning process. Therefore, teachers are required to prepare for education necessities, decisions, choices, and adaptations to meet student expectations, teacher education requirements, and the conditions under which universities and schools operates, this becomes imperative because of the COVID-19 pandemic have makes many educators and forced them to teach online classes, necessitating opportunities to reshape education, teacher education, and educational institutions at large. Hence as a result, the face-to-face teaching and learning process stand to be modified to accommodate the e-learning environment. In practice, e-teaching and learning activities are conducted virtually via Google Classes, WhatsApp groups, the Moodle platform, and Zoom meetings and the Used of mobile technologies.

Before the current overwhelming perspective, researches have proved that, educational system

around the world has been greatly influenced by the use of materials and tools in teaching and learning, which is undeniably helpful in making the process more meaningful. Therefore, the current developments have opened up opportunities for educationists to design and implement Information and Communication Technology (ICT) based lessons. (Rashidah, Parilah, Russeni, & Juhaida; 2013). The bridge between education and internet technology use has made a great impact on this paradigm shift about teaching and learning process. In fact, as a result of the application of ICT and Virtual Learning Environment (VLE), not only the relationships between teachers and students have undergone a phenomenal change, but also the role of the teachers, the nature and context of learning and as well as the function and relative importance of the contents of courses have all been challenged and redefined. (Eisa, 2012).

In broader sense, information technology includes the technology used to communicate information that encompasses telephones, fax machines, mobile phones among others. In today's digitalized world however, the terms ICT and VLE have become very important and useful in modern technology. They have the potentials of being able to meet the learning needs of

individuals, promote educational opportunities, offer high quality learning materials, increase self-efficacy and independent learning among students, and improve teachers' professional development. (Abolade & Yusuf, 2005; Barad, 2009; & Eisa, 2012). In recent time, there has been a great interest on how computers and the internet can be combined to improve the efficiency and effectiveness of educational practice at all levels. However, ICTs facilities are many not only the mentioned ones, there are other older technologies which include the telephone, radio and television, although now they are given less consideration. For instance, radio and television have been used as instructional tools over forty years, for open and distance learning, in both developed and developing countries like Nigeria. ICT opens more ways of learning, for instance, the Web 4.0 applications trigger some 21st century skills namely critical thinking and problem solving, collaboration and communication, global awareness and information literacy (Potashink & Capper, 2010; Zhao & Wanxin, 2010).

The broad term Information and Communication Technology (ICT) can be seen as process, which are set of activities facilitated by electronic means: that is the capturing, storage, processing, transmission, and display of information. While as a product it covers the hardware and software,

the network, and several other devices that convert information into digital form. They include the outputs of industries as diverse as telecommunications, television and radio broadcasting, computer hardware and software, computer services and electronic media e.g., the Internet, electronic mail, electronic commerce and computer games (Curtin, 2002; Jacobsen, 1998; Moursund & Bilefeldt, 1999).

ICT tools are numerous and they include traditional hardware and software such as radio, television, motion picture projector, camcorders, audio player, photography camera, to mention a few. It covers the established and emerging hardware and software like computers, notebooks, mobile phones, mps, e-book readers, personal digital assistants, interactive white board, e-mail, video conferencing, and so on (Anderson, 2010; Curtin, 2002; Moursund & Bilefeldt, 1999). Therefore, as a result of the continuous utilisation and application of ICTs facilities in educational setting, it leads to the emergent of innovative learning approaches such as: E-learning that encompasses learning at all levels, formal as well as non-formal, using information networks such as the internet, intranet or extranet for course delivery, interaction and facilitation. While blended learning are models of learning, which merge conventional classroom and e-learning situations.

The blending of different methods was propounded after educationist acknowledged that not all learning is achieved in an electronically mediated environment, in particular one that dispenses with a live instructor altogether. Open and distance learning is a learning approach in which teacher and learner are separated in time or place and uses a variety of media, including print and electronic, to ensure a two-way communication that allows tutors and learners to interact (Anderson, 2010; Ferry, 2009).

ICTs, such as mobile technologies and teleconferencing technologies, which make it possible for dispersed learners to receive instruction simultaneously. The Internet and the World Wide Web also provide access to learning materials in almost every subject and in a different form of media anywhere at any time of the day and to an unlimited number of people. One of the most commonly reasons for using ICTs in education has been to better prepare students for a workplace where ICTs and its auxiliaries can improve the quality of education by increasing learner engagement and motivation, by facilitating the acquisition of basic skills and by enhancing teacher training (Anderson, 2010; Ferry, 2009).

Notably to all, 21st century presents its citizen with new opportunities, choices, and challenges due to the prevalent of technology which has affect all

facets of human endeavour such as in Business, administration, government, education, among others. Hence, there was a shift occurring in the academic fields, which must be viewed from the perspective on the new possibilities that technology has brought in to the system, and as a result of this traditional teaching and learning ideology has been shaken by the impact of the integration of information and communication technology (ICT) into educational practice and the acquisition of skill, literacy and numeracy in the usage of information and communication technology. Thus, the modern society is deeply immersed in knowledge acquisition, a rational and reflective use and distribution of information, in which the most outstanding communication means are telemetric networks, therefore, one of the greatest challenges to overcome in the 21st century is for teachers and learners to achieve competency in the use of technology. In this line of development, it was understood that, the internet and other technology devices have gained attention in the field of education. These technologies have been quickly adopted and are becoming mainstream methods. One of these technologies is Modern Mobile Phones with software. Mobile technology is a term that described technologies that is built on cellular communication technologies, examples, include

tablets, cell phones and laptop among others. (Yusuf, Lawal & Oyewusi 2013).

Hence, Mobile technologies including smart phones, games consoles, media players, net books and computers. Perhaps the various functions and mobility are more important than the individual or social groups associated with each category of devices. These functions include connecting and communicating through telephone network, text or number, running applications comparable to computer programmes and providing output in the form of documents, movies, music and animations. These innovative technologies have important roles to teaching and learning, among these technologies are; the cell phones, tablet PCs, games, computers, digital sound recorders are the most commonly used devices. Mobile technologies are technologies that are portable, such as laptops, notebooks, tablets PC and mobile phones. (Poslad, 2009; & Shin, 2011; Şenli, & Doğan, 2010). (Alexander, 2004; Blackboard, 2012; Traxler, 2005 & Traxler, 2011).

Ally, 2005 & Traxler, 2011; they described Mobile technologies as smart-phones, games, consoles, media players, and notebooks and handled computers. That, these technologies equally include personal digital assistants (PDAs), smart phone, E-book reader, MP3 player, iPod and among others, that has the features of portability, connectivity and immediate communication

which support teaching and learning. Hence, as a result of the increase in the use of mobile technologies, there is growing interest in its use in education and training. This is evident in the developing countries, where citizens are obtaining mobile technology instead of computers. Educators and trainers will have to develop learning materials for delivery on different forms of technologies, including mobile devices Most of personal mobile technologies such as mobile phones are common amongst student populations in university, but many university teachers are less convinced in its utilization in teaching and learning. Even if a teacher is competent and avid user of personal mobile technologies, he or she may feel ill-prepared to use them with students in pedagogically innovative ways Mobile technologies have been in used in different educational settings for a different purpose in educational goals, the claims of its positive use in different aspects of education was for the understanding of complex concepts or the development of skills which allow learners to engage in problem-solving. In the past few years there have been significance advancement of technology with the rise of mobile technology leading to an era characterized by the instant access to and mobility of information. Mobile technologies such as cellular phones, personal audio players, personal digital assistants, and

portable computers have reshaped and redefined the ways in which information is constructed, accessed, and communicated among individuals and societies. (Ally & Tsinakos; 2014; Oguz, 2012). (Naismith; Lonsdale; Vavoula; & Sharples 2005).

Conceptual Definitions & Meaning of Mobile Technologies

The introduction of the mass media brought about information and communication Technology (ICT). The driving forces of the information revolution and the information society are the development, diffusion and use of information and communication technologies (ICTs) in contemporary societies. The diffusion of ICTs has contributed enormously to the growth of education and economies in developed and developing nations are earnestly facilitating policy frameworks to ensure an equitable diffusion of these technologies. ICTs can therefore be referred to digitally based tools that are used for information processing, storage, dissemination and retrieval. It also includes the different infrastructures used in these processes, their applications and the numerous services these infrastructures render. Information and Communication Technology (ICT) has great impacts in education and this have been proved in different studies in the sense that it makes teaching and learning more interesting,

motivating as well meaningful. In recent time, there has been a renew interest on how computers and the internet can best be combined to improve the efficiency and effectiveness of educational practice at all levels. However, ICTs facilities are more than the mentioned technologies above, there are other older technologies, such as the telephone, radio and television which have been used as instructional tools over forty years, for open and distance learning, in both developed and developing countries, Nigeria inclusive. ICT opens more ways of learning, for instance the web 2.0 applications which trigger some 21st century skills namely critical thinking and problem solving, collaboration and communication, global awareness and information literacy (Falade, 2011; Potashink & Capper, 2010; Yusuf, 2005; and Olasedidun, 2014). (Green, 2010).

Mobile Technologies: They are technology that are portable; it refers to any device that you can carry with you to perform a wide variety of educational tasks, ranging from cellular phone, PDA, laptops, among others. Mobile technology is among the most widely used technologies in education nowadays. It comprises all forms of portable technology, such as cellular phones, laptop computers, palmtops or personal digital assistants (PDAs), global positioning systems (GPS) and wireless card payment terminals

(Muhammed, 2005). In this present time, there are growing needs on the affordability of learning with mobile technologies this is because, different teachers and disciplines will have different conceptions of teaching that they will want to bring to education. This conception of teaching may vary from ones primarily concerned methodology for the delivery of content, to ones supporting students learning that is by discussion and collaboration. Mobile technologies clearly support the transmissions and delivery of rich multi-media content and they also support discussion and discourse, real-time, synchronous and asynchronous. (Kember, 1997).

An overview of contemporary approaches and challenges in Education

In this 21st century, there is no watertight classification as regards to approaches that can be used for effective instructional process in school system especially given the present day where most of the students are digital native. But essentially, our concern here is to identify some common but contemporary approaches which can be used around effective curriculum delivery in school system. However, the listed below can be seen as being a contemporary approach to teaching & learning in this Post Covid Period

Collaborative learning

Blended approach

Hybrid learning approach

Cooperative learning approach

Flip Classroom

Gamification etc

Generic Challenges/Impediments Associated with Modern Instructional Process

Current Education System Falter in the Light of the Fourth Industrial Revolution: While the world is teeming with industrial disruptions and every day brings some new technological advancement, the education system suffers from obsolete methodologies and education content

Boredom and Mundane Nature of Teaching:

Studies revealed that one out of three teens in America is bored most or all the time in school. Furthermore 80% of students feel stressed and 34% feel depressed and all these issues can find their roots in boredom and the mundane nature of teaching. What makes the entire scenario gloomier is the fact that the evaluation procedure for the students continues to be the same for ages. The students who are unable to write fast, or describe things or events properly lag in terms of score.

Technical Issues: The COVID-19 pandemic has shown multiple technology challenges the education sector is suffering from. From teachers grappling with the basic controls of online collaboration software, to the ones that face a tough time in sharing or creating digital files, there is a whole other stratum of challenges that still need to be addressed.

Professional Development: There is a huge skill gap between the graduates and the professionals the modern employment sectors require. Further, this lack of professional development is for the teachers as well because they lack proper training and resources to integrate modern technologies into classroom teaching.

Lack of Personalized Learning; Judging every student via a single exam is no longer relevant; especially when the objective examination process is gaining popularity across the entire globe. Also, there is a lack of technologies that can help teachers impart personalized learning, in a limited period of one class. Hence, there is a grave need for personalization in education. After all, someone with an interest in finance is not going to use Organic Chemistry synthesis concepts later in life.

MOOCs and New Models of Schooling: While there are several open-source learning platforms

and sources of education, the new models of schooling are still going to take a long time to get conceptualized. There is no standardization in MOOCs and other academic content available online, and the educational institutions are still not aware of such educational resources that they can use for teaching.

Assessment Strategies

As mentioned earlier, assessments have always remained a major challenge for educators with questions getting repeated for decades, evaluation methodologies remaining the same, and unequal evaluation being rampant. While several exams are now MCQ-based or objective in nature, a multitude of them is still subjective. Also, there is a weak relationship between learning outcomes and assessment and the students have no right to “*know*” whether they are assessed properly, or “*how*” they are assessed. Current assessment methods are vulnerable to bias as there is no transparency in the evaluation process and prompt feedback on assessed work is still missing from the scene. Classroom assessment techniques are less authentic, and the students never get to know whether there was a mix-up or not. Hence, in this segment, technological intervention is highly required

Expensive Modern Technology Infrastructure:

Adopting EdTech is easier but facilitating funds for mass adoption is certainly a daunting task. Further, most of the modern technological infrastructure is out of the budget of a majority of educational institutions. A recent report revealed that 37% of the teachers in various institutions have taken it upon themselves to facilitate EdTech for their students. They get whatever equipment they feel is important by spending money out of their own pockets. While this is certainly a noble initiative, it is not a solution.

Virtual Classroom Engagement: During the pandemic, online classes became a compulsion, instead of an option and they are now going to be a new normal in the education sector. However, there is no way to gauge the student engagement in the virtual classroom because:

- Student to teacher ratio is high
- Limited class time
- Lack of proper monitoring metrics in the virtual classroom
- Students can cite network issues as the cause of switching the camera off

Further, there is no proper monitoring when it comes to online tests and exams. Teachers cannot explain things as easily as they can do in the

classes with the help of the board and actual activities. Hence, the students tend to lose focus and motivation to stay alert in the class.

Taxonomy of Mobile Technologies for Instructions at Post-Covid

Basically, researches around the used of ICT in education have revealed that, ICT tools can be classified into four broad categories: informative tool; communicative tool; constructive tool; and situating tool. Informative tools offer immeasurable quantity of information in different design such as text, sound, graphics, or video. Examples of informative tools include web resources or digital libraries. Communicative tools can help to exchange information between the teacher and students or among students beyond the physical barrier of space, time, or both. Examples of communicative tools include chat rooms, online discussion forums, or videoconferencing. (Peck & Mullen, 2008; Yarlagadda, 2005). Constructive tools can be used for manipulating information, constructing knowledge or visualizing understanding. Examples of constructive tools include multimedia authoring tools or concept mapping tools. Situating tools are most likely to be a learning environment where students may explore the context and happenings. Examples of situating tools include three-dimensional virtual reality, or

simulation programmes (Chen, Hsu, & Hung, 2000; Lim & Tay, 2003; Wang, 2006).

In this present time and with the improve in the development of Internet fostering the creation and proliferation of interactive media, such as the world wide web, streaming media and mobile technologies. These therefore, make mobile technologies possible a broader powerful repertoire of pedagogical strategies. This novel media makes possible evolving university instruction, beyond conventional teaching-by-telling and learning-by-listening (Kirkley, 2005). Mobile technology is what the name denotes that is a technology that is portable; it refers to any device that you can carry with you to perform a variety of activities or tasks. It is technology that allows tasks to be performed via cellular phone, PDA, laptops, among others (Ally, 2005; Daichendt, n.d).

Anderson, 2010; Curtin, 2002; Moursund & Bilefeldt, 1999 & Quinn 2007, identified the following forms of mobile technologies that can be used for instruction:

- Cellular Phones,
- Mini-Laptop Computers,
- Palmtops Or Personal Digital Assistants (Pdas),
- Global Positioning Systems (GPS)
- Smart Phone
- iPad-Tech

- Notebook among others



Mobile Technologies & Instructional Uses for educational process in the new normal

The use of mobile technologies is gradually increasing and diversifying across every sector of education and business, and across both the developed and developing worlds. It is gradually moving from small-scale, short-term to a larger more sustained and blended development. The computers have become an increasing compelling choice of technology for classroom because they enable a transition from the occasional, simple mental and essential use of innovative technology. Mobile technologies can be used to respond to the challenges of particular

educational context; supplement and enrich formal schooling; and make learning more accessible, equitable, personalised and flexible for students everywhere (Akorede, Adefuye and Alaba, 2012). Research findings in advanced countries revealed that teachers and students respond to handhelds favourably and that handhelds were effective instructional tools with the potential to impact student learning positively across curricular topics and instructional activities (Crowford and Vahel, 2002; Traxler, 2007; Vahey and Crawford, 2002).

iPod has several instructional uses. With the iPod; students can download podcast of relevant instructional materials along with audio and video lectures. The video iPod, for example, allows students to exchange information files, collaborate on projects work and prepare for exams, showcase their work, and share project results. The instructor has the advantage of providing stage-by-stage explanation that is not possible with words. Additionally, learners or the teachers can attach microphone to the iPods in order to capture material for educational use.

MP₃ and MP₄ Player: These digital audio players play music and audio files. Some models have an integrated voice recorder and line-in recording. Instructional uses of MP 3 and MP 4: Students can use an MP3 player to download and listen to podcasts and audio lectures. It is equally used to

compress music from the internet, playable on a multimedia computer with appropriate software. While the MP₄ has additional function of storing and presenting visual materials (Anderson, 2010; Curtin, 2002; Moursund & Bilefeldt, 1999 & Quinn 2007)

Personal Digital Assistant: Personal digital assistant, PDA has different forms of functionality because of its inherent or in build features, such as access to internet, computing ability and networking characteristics. It is well design mobile technology that equally has note pad; book address; calendar and other important productivity functions

Instructional uses: PDA play audio, video, and Flash movies; displays and permits editing of text documents; allows the users to check email, used as mass storage and SMS & IM text messages. PDAs support interactive, collaborative learning. Students can use them to present projects; conduct research; word process documents (with a peripheral input device); and take notes in class (Fenrich, 2005; Quinn, 2007).

Smart Phone: Smart phone has an integrated functionality in it. Such functions include inbuilt camera, networking and internet access, mass storage, telephone and video functions in one compact system. There are different usages of this mobile technology amongst are: Teachers and students can use it to play video, audio and flash

movies. Moreso, it can be used for audio and video lectures download and as well edit online text. Used for sending IM and text messages and use the phone for mass storage. Smart phone also enables global collaboration and scientific experimentation and research. Users also can access information globally. Smart phones thus support interactive learning. There is different type of mobile phones depend on their sophistication (Anderson, 2010; Curtin, 2002; Moursund & Bilefeldt, 1999 & Quinn 2007).

The Personal Media Player (PMP) or Personal Media Centre (PMC) is a relatively new class of mobile device. These systems are focused on media delivery and can play, store and manage a variety of digital media formats. A fundamental classification within these three types of devices is between those that are able to connect to the Internet and those that cannot. Livingston (2004) coins the term MIAD: Mobile Internet Access Device. The emergence of technologies such as Wi-Fi (802.11) and 3G which permit such high level of connectivity have opened up a new arena of prospective for mobile technologies

Ultra-Mobile PC (UMPC): An ultra mobile PCs have the characteristics of a standard tablet personal computer, but it is relatively small in term of package. They support audio, video, and surfing the internet; and other communication

and networking applications. They have inbuilt Bluetooth, Wi-Fi, and Ethernet enable.

Instructional uses: Students can download audio and video lectures and podcasts to their UMPCs; create and edit course-related assignment; surf the web; send e-mail, and other important functions such as sending IMs, and text-messages. UMPCs enable global collaboration, scientific experimentation, and research. Users also can access information globally. UMPCs thus enable interactive learning.

Laptop/Tablet PC: It is generally inclusive and well-designed system of all the mobile technologies mentioned earlier. Laptop/tablet PCs are designed with Bluetooth, Wi-Fi, and Ethernet enable. They are a robust productivity tool. Tablet PCs offer added quality such as writing identification and voice-to-text exchange as part of their functioning systems.

Instructional uses of laptop/tablet pc: Students can download audio and video lectures and podcasts; create and edit course-related assignments; surf the Web; send e-mail, browse the course Web site at home, work and or road. The units provide a high level of interactivity for global collaboration, scientific experimentation, and research (Anderson, 2010; Curtin, 2002; Moursund & Bilefeldt, 1999 & Quinn 2007).

Walsh (2012) in his own opinion in relation to mobile technologies submitted that there are nine

most ranking technologies called the top nine emerging education and instructional technologies and resources which are:

1. The flipped classroom: It is a spring pose in form of the rhetorical question and intuition for distribution awareness concerning the influential idea of presentation which continues to grow.
2. The apple iPad and other tablet devices: The iPad has proliferated at a rate far surpassing any other technology introduction. This is because they have high level of connectivity with WIFI and GPRS.
3. Smart phones: We cannot continue to ignore these ubiquitous devices. The vast majority of students in high schools and colleges have them. They are great for interactive polling, tweeting and research purpose.
4. Gamification of education: There are many reasons why this idea is gaining popularity including that it can deliver. The Khan Academy is using it, is leveraging gamification (and many of the other ideas).
5. Emergence of free online courses: The MOOCs (massive open online courses) are just one option for learning – massive open online courses are not all free courses and vice-versa.
6. 1 to 1 and BYOD (Bring your own device) initiatives: Many educators feel passionately that '1 to 1' makes a lot of sense it's an ideal that can

be so engaging and that overlaps with some of the other tools and techniques.

7. Cloud apps for file storage, note-taking, and more: Internet tools are relevant apps in instruction for a quiet number of years. Other cloud apps are seeing explosive growth, encouraged by the increasing tendency for computer users to have multiple devices from which they want to access their own personal content.
 8. OER (Open Educational Resources): Is a transformational idea that can play an important role in changing the nature, availability, and costs of educational materials, content, and tools.
- Learning Analytics: Is another technology that has really begun to gain momentum over the years or so, and is clearly focused on enhancing learning outcomes by leveraging data. After seeing the phrase pop up repeatedly in educational technology media, a month later delved into Learning Analytics and may only be emerging from its infancy, but the growing number of institutions and organizations working to deliver and leverage the concept positions it as one of the top technologies that can help to deliver on the promise of increasing the efficiency and effectiveness of instruction through the thoughtful and informed application of information technologies (Walsh 2012).

Specific Challenges Associated with the Use of Mobile Technologies for learning

- Poor internet facilities to support effective use of mobile technology in school
- Gap in skill and competency of teachers in handling mobile technology for instructional process
- Absent of periodic training for teachers and students
- Crisis in managing students time and content delivery vide mobile technology usage for learning
- Inadequacy of infrastructural facilities to support maximum mobile technologies use
- Unwillingness to use mobile technologies for instruction by some teachers because of their nerviness to technology;

Theoretical Framework

The foundational theoretical framework for this study lies with the framework postulated by TPACK which essentially grounded on the foundation that teachers need to be effective and proficient in teaching. TPACK is a theoretical framework that focuses on how teachers integrate technology into their teaching practice. Mishra and Koehler (2006) suggest a knowledge base that is necessary for teachers to have prior to implementing the use of technology in their

lessons. It is the basis of teaching effectively with technology. It requires a comprehensive understanding of relevant concepts and pedagogical techniques, in addition to associated content knowledge. Moreover, Mishra and Koehler (2006) assert that even in circumstances where teachers have existing technology skills, it does not necessarily mean that they are competent in their practical employment of those skills. In other words, having those skills does not mean that they are automatically able to teach them. TPACK is more than just having knowledge about educational technology use; it is also about how to make subjects easier to learn with specific pedagogical practices in order to ultimately improve teachers' practices (Koehler et al., 2013). Abbitt (2011) maintains that the personal use of technology does not signify the transfer of proper technology integration into teaching. Many academics agree that what this essentially means is that whilst being able to use technology and possessing knowledge about technology is beneficial in terms of developing new skills, it is not at a sufficiently high level to match the knowledge that teachers require to be able to integrate technology into their teaching practice, and this is the case for any grade or subject (Harris et al., 2009; Brantley-Dias and Ertmer, 2013; Koh and Chai, 2016). Voogt et al. (2013) define TPACK as the knowledge teachers have of how to merge

their content knowledge with their pedagogical knowledge whilst using modern technology so as to facilitate subject learning for their students. When pedagogy, technology and content are appropriately combined, only then can teachers successfully achieve technology-enabled learning.

The development of this knowledge is critical for teachers to teach effectively supported by technology. Well-constructed TPACK enables teachers to acquire a more comprehensive understanding of how technology can support students' learning (Tseng, 2016). While technology helps teachers teach their subject content with solid pedagogy, it also demands that they embrace new knowledge as it emerges. Many teachers find learning to develop new pedagogical approaches challenging. Koehler and Mishra (2009) suggest that problems typically arise when teachers have been provided with inadequate training programmes, as this results in teachers feeling unprepared to integrate this new technology into their lessons. An important factor to bear in mind is that many teachers in practice actually earned their degrees at a time when educational technology was not as advanced as it is nowadays. This aspect is not a new concept, as Shulman (1986) has discussed, for teachers' knowledge needs to continuously develop and grow in order to adapt to new practices which

present their content in an updated pedagogical form. Teacher education needs to evolve from the usual focus on content knowledge, and instead determine new ways to present their subjects to their students.

Mishra et al. (2011) argues that rapid changes in technology can be a challenge for many teachers to keep up with and familiarize themselves with as, often, as soon as they become comfortable with one particular technological device, a new one emerges. Teachers' readiness to keep updating their knowledge depends on several characteristics, such as age, experience and subject area, as well as their own level of self-esteem. Mishra and Koehler (2006) suggest appropriate targeted training in the use of technology as an educational tool effectively helps teachers to acquire technology skills they did not previously possess. Hence, in terms of integrating technology into their lessons, teachers tend first to become more confident, and second to become capable of more appropriate execution of their strategies (Mishra et al., 2011; Mishra and Koehler, 2006). TPACK development is therefore a crucial approach to follow so as to effectively aid teacher development and education. Teachers do not always differentiate between the technological functions and educational affordances of technology. They strive to achieve

educational knowledge in using technology in a way that is most beneficial to their subject learning outcomes, and to do so, teachers require targeted professional development and training. Teachers must learn about using technology from a content perspective, which would increase the likelihood of them using it to support their teaching. Conversely, if they were only taught to use technology as a skill, they would face difficulties in integrating it into their practice for educative purposes. The TPACK framework was designed to lead teachers along the technology integration path. Additionally, the framework can be used as a model for required teachers' knowledge for technology integration, or as a model of how technology integration arises (Abbitt, 2011). It may also be used to influence the design of training for pre-service teachers, as well as professional development for in-service teachers (Schmidt et al., 2009). Moreover, the ability to practice good teaching requires an understanding of how content and pedagogy are related to the use of technology. Every form of technology has its own properties and attributes; therefore, teachers need to understand which technologies are more suitable to use with specific tasks (Hughes, 2005; Koehler et al., 2007; Tseng, 2016). Conclusively, it is worthy to note that, TPACK framework has been described as a complex connection between three main

intersections, of content knowledge, pedagogical knowledge and technological knowledge, as shown in Figure below:

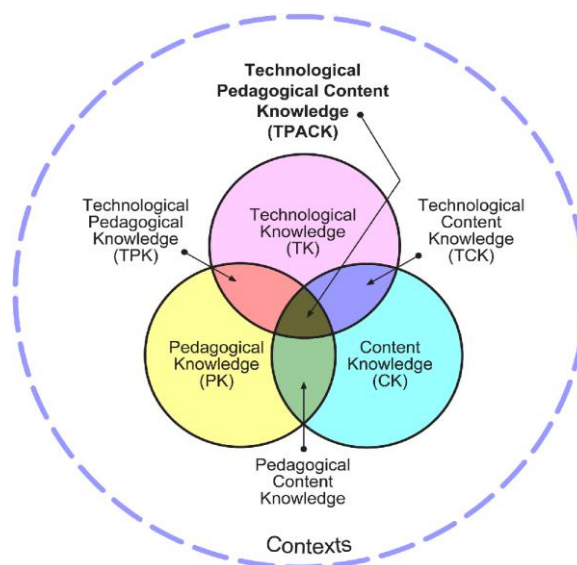


Figure 1. The TPACK framework and its knowledge components., Content Knowledge

Empirical Framework

In the 21st century constructivist learning ideologies are becoming more recognised because they typically believe that learning should be student-centered, collaborative and active. In this sense, teachers who integrate technology into instruction are likely to hold student-centered constructivist pedagogical beliefs and a stereotype of this new paradigm shift in teaching and learning process is the use of mobile technology for instruction. Mobile technology is a term that described hand held technologies that is

built on cellular communication technologies. This is because mobile technologies can facilitate conventional classroom instruction and can provide quality distance learning opportunities. (Blackboard, 2012).

There are studies carried out related to ICT in education, but studies which are specifically related to the use of mobile technology for instruction in Nigerian Schools include; Yusuf, Lawal, and Oyewusi, (2013) which is an assessment of the Effectiveness of Mobile Technologies and Inquiry-Based Teaching Methods in University of Ilorin, Nigeria; Similarly, Suleiman (2013), Conducted a research in the Use of Mobile Technologies for instruction, in Colleges of Education in Nigeria, at Ahmadu Bello University Zaria and Aderinoye, Ojokheta and Olojede (2007) come up with alternative ways of educating the nomads using ICT in Nigeria. They emphasize the use of mobile learning using low-cost mobile technologies (i.e., mobile phones). In order to improve the literacy level amongst Nigeria's nomadic, majority of them are enrol in nomadic education programmes in the country. Also, it was noted that the use mobile phones are common in some parts of the country and can be adopted for teaching nomads. They explore the need and advantage of integrating mobile learning in Nomadic Education in Nigeria, that this would ensure successful implementation and

achievement of the goals of the programme. Nzeakor, Urenyere, and Eziabala's (2012) they conduct research on the prospects and challenges of M-learning in our tertiary education. These studies found out the effectiveness of integrating mobile technology in teaching and learning. Katieleasor (2011) evaluates and draws conclusions about a mobile education programme, called project Alphabetisation de Base parcellulaire ABC in Niger.

Advantages of the used of Mobile Technologies for learning

There are reasons behind the use of mobile technologies in education have been identified as a three stages phenomenon; motivational factor as to improving access, exploring the potential for changes in teaching and learning, and alignment with wider institutional or business enterprise. But in a more pragmatic means, the emphasis is on changing teaching and learning, practitioners and researchers are interested in collaborative learning, students' appreciation of their own learning process, consolidation of learning and ways of helping learners to see a subject differently than they would have done without the use of mobile technologies.

Specifically, it has the following advantages as thus:

- Just-in-time learning and support for managing learning by teachers and learners
- There is awareness that the new technologies may have a role in reducing cultural and communication barriers, and that they are altering attitudes and patterns of study
- Academic learning environments have begun to support mobile initiatives, such as desire2learn 2GO. Connecting to online systems anywhere enables students with proper access to view course details and class lists, view and edit their user data and grade values or sign up for study groups at any time.
- Makes teaching and learning NOT geographical bound
- It facilitates easy dissemination of information, skill and knowledge between teacher and students
- Mobile technology usage for instruction increases it brings about three features viz: reduced the time for difficult work and allows the teacher to readily select materials and present or broadcast them to students, as well as mark and revise students' tasks through the use of e-whiteboard and mobile technologies that enable numerous tasks to be completed instantly.
- In addition, it allows students not only able to discuss course work with each other face-to-face, but are also able to exchange personal materials through the mobile technologies and

the process of interaction can be recorded thus facilitating group collaborative learning

- Allow for empowering the teacher to monitor students' learning progress which means a number-signal is provided to each mobile device that represents different status using a mobile device such as disconnected to the server or request for help, therefore the teacher can monitor students' learning progress and determine how to implement the subsequent activities
- The use of mobile technologies offers opportunities to learning experiences which permits people to experience new situations concerning learning in a broad variety of learning approaches. This is possible because of three key important factors of mobile technologies are Portability, anytime-anyplace connectivity, and immediacy of communication which is great potential for learning and teaching support.

Conclusion

The contemporary teacher educators and trainers must be prepared and willing to design and deliver instruction using mobile technologies. In addition to delivering materials, mobile technologies can be used to interact with learners, especially those who live in remote locations. At the same time, learners can use the technologies to connect with each other to collaborate on projects and to

debate and discuss ideas While the word perception is a process of translating sensory idea into an integrated analysis of the world around with the present situation based on incomplete and unverified information, perception is equated with reality for most practical purposes and guides human behaviour in general. Perception can be seen as a way of understanding issues and the psychological ability to process or use information received. Perception has been reported to depend heavily on the background knowledge (Daramola, 2011).

Recommendations

- i. Need to provide professional development skill training for in-service & pre-service teachers in order to be able to use technological devices effectively for teaching & learning process
- ii. Ensuring provision of the needed infrastructure that will support the uses of modern technological devices
- iii. Enabling environment and provision of adequate internet facilities and resources for smooth utilization of technological devices

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