

Teacher education in Nigeria and the emerging technologies in the 21st century classroom

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ABSTRACT

The paper examines Teacher Education in Nigeria and the emerging technologies in the 21st century classroom. The concepts; emerging technologies, teacher education, and the roles of teachers in the 21st century classroom were analyzed. Availability, Accessibility and Competency were discussed in the light of the emerging technologies as an instructional mode in the classroom. This is an opinion based paper. It was concluded that the 21st century classroom requires a prepared teacher with an emerging technology-compliance and the right frame of mind. It was recommended among others; government's policies and legislative approaches that will support in practical terms availability, accessibility and professional development be formulated and implemented to ensure competency and motivation as well as monitoring and evaluation framework.

Keywords: Teacher education, emerging technologies, 21st century classroom.

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INTRODUCTION

Every human being by nature is a teacher. Teaching takes place once an activity, formal or informal, leads to change in an experience or behavior in someone else from unknown to known. The traditional African society prior to the advent of colonialism had forms of teaching and learning system in which the parent or elders inculcated societal norms and values on the younger generation or to one another. The system was moralistic, simple and pragmatic. The traditional African teaching process depended on every day experiences using tangible and intangible materials found in the environment such as artifacts, crafts, natural resources, festivals, folklores, arts, idioms etc, to aid teaching and learning, which is still in use today to preserve and transfer our cultural heritage even though it was informal. Today, education vis-a-vis teaching has taken a new dimension as some persons are versed with the right and responsibilities to carry out teaching functions, otherwise called a teacher. Consequent, such individual must pass through some specific and specialized training through designated platforms and specialized programmes and process called Teacher Education.

In tandem with the above and given the specialized teachers' roles in the developmental process of all individual and the nation, it is observed by the writer that, the Federal Government of Nigeria presently places emphasis on the teaching profession as enshrined in the National Policy on Education which states amongst the goals of teacher education is to produce highly motivated, conscientious and efficient classroom teachers for all levels of the educational system, provide teachers with the intellectual and professional background adequate for their assignment and to make them adaptable to changing situations (Federal Republic of Nigeria, 2013). Corroborating the above position, Abba (1992) as cited in Ukoha (1999) opine that "if education has to do with teaching, curriculum and setting, then teacher education has to do with creating an enabling environment so that someone can impart through different ways appropriate knowledge and skills to someone who is willing to be a teacher, or someone who is already a teacher but wishes to enhance his/her capacity in discharging those teaching functions effectively.

Interestingly, the paper avers that the essence of

teacher education is to inculcate in a would-be teacher, acceptable attitudinal, behavioural, knowledge, values and skills approvable by educational and socio-political policy makers and implementers. The way to train teachers with these cherished qualities, according to Ukoha (1999) is through professional teacher training that will result in an educated person who possesses a firm grounding of chosen subject-matter. Besides these attributes as posited above, it is expedient that teacher education should also produce individuals who can see, analyze, and interpret the needs and aspirations of citizens and the learners particularly, in the classroom. Teacher education is not an "island" to itself; it is geared towards aligning with the competitive contemporary global community, via the global best practices, brought by the emerging technologies such as Visual media technologies to stimulate the sense of sight (Etim, 2006), Audio-visual technologies such as the Television, Close Circuit Television, video machines, Aural instructional Media etc. In line with the above, UNESCO (2008) reported that, ICT plays different, but complementary roles, with new technologies, requiring new teacher's roles, new pedagogies and new approaches to teacher education. The new deal in the teacher education in the flipped classroom is ICT-supportive. According to the Nigeria National Policy on Education (N.D) cited by FRN (2013), all teachers in educational institutions shall be professionally trained. Teacher education programmes shall be structured to equip teachers for the effective performance of their duties and Information and Communication Technology (ICT) training shall be incorporated into all teacher training programmes.

In a bid to buttressing the above assertion, the paper avers the need for a powerful role of teacher training in the process of educational innovation and the implementation of ICT. The teacher training institutes such as the Colleges of Education and Faculties of Education in Universities should inculcate in the mindset of intending teachers of the future assumption and values that teachers are key figures in the learning processes. Invariably, educational institutions, expectedly, should anticipate new developments and prepare prospective teachers for their future role (Tella, 2011). This is so as various technologies are emerging by the day, making the 21st century classroom more engaging, compelling and attractive, giving the modern teacher new roles, new methods and new engagements in and out of the classroom.

LITERATURE REVIEW

Teacher education in Nigeria at a glimpse

In Nigeria as in most developing economies, teaching profession is entangled in controversies and set-backs. The societal perception, poor remuneration,

government's bureaucracies, and laxity in policy implementation, puts the status of the teachers in the state of classlessness. This is a post - colonial impression, as teachers were highly rated in the past. At a point all sorts of persons who failed to gain employment at choice outlets, end up in the classroom. The general belief was that anybody trained or untrained can teach, and jobs were to some extent available in schools. There came a turning point to this unfortunate circumstance. Various legislations and policies have positioned teaching in a professional status. National Policy on Education, FRN (2013) emphatically described teaching as a profession. On the strength of the policy provisions, one who is classified as a teacher must acquire teacher education in order to possess specialized knowledge, skills and attitude needed to perform the task of teaching in the school system. The acquisition of the specialized competencies, qualifies a trained person to be a professional teacher. Furthermore, competencies and professionalism implies that teacher education is designed for certification after acquisition of pre-requisite knowledge, skills that is those willing to be teachers from the onset or who are on the job and are willing to acquire professional qualification, needs to undergo teacher education (teacher trainees). The teacher education programme prepares the two categories of teachers; teacher trainees and on-the-job trainees to acquire intellectual and attitudinal expectations, subject-matter knowledge and skills aimed to equip him or her for effective delivery at any level of schooling as well as socio-societal adaptations. In addition to their primary tasks, teacher education also prepares an individual to work as school administrators, supervisors of schools, guidance counselor, and measurement and evaluation experts in the school system and may as well function outside the school system. Gleaning from the Nigeria National Policy objectives for teacher education, there is a set of objectives and a frame work for determining training outcomes in teacher education aimed at producing efficient, effective and result-oriented teachers, these includes; to produce a highly motivated, conscientious and efficient classroom teachers for all levels of the educational system, encourage the spirit of enquiry and creativity in teachers, help teachers fit into the community and the society at large, and enhance their commitment to national goals; provide teachers with the intellectual and professional background adequate for their assignment and to make them adaptable to changing situations; and enhance teachers' commitment to the teaching profession (FRN, 2013).

The above policy objectives supposedly create a pedestal for a prepared, motivated and result-oriented would-be professional teacher. However, the realizations of these objectives are still in a flux and uncertainty in practical terms. In furtherance of the above-mentioned objectives, programmes and curricular, professional teacher awarding institutions were harmonized by various

responsive commissions and bodies, namely, National Universities Commission (NUC) National Commission for Colleges of Education (NCCE) and National Teachers Institute (NTI), for degree, and National Certificate in Education (NCE) and Teachers' Grade 11, to ensure sound academic attainment for Nigerian teachers. The curriculum of teacher education in Nigeria in various awarding institutions is structured, thus:

- General studies (basic general education)
- Foundation studies (principles and practice of education)
- Studies related to the student's field of teaching (subject-matter)
- Teaching practice
- The successful achievement and implementation of the curricular depends on the depth of coverage of learning experiences by different schools.

As a step to consolidate the professional status of the teacher in Nigeria, the National Teachers Registration Council was put in place for certification of professional teachers. Every teacher in the school system in Nigeria is expected to be professionalized by the body. So far, the bodies are making in-roads into the policy and teachers are keying into it through the policy framework.

THE CONCEPT: EMERGING TECHNOLOGIES IN EDUCATION AND CLASSROOMS

The emergence of various technologies for teaching and learning has brought a new face to the classroom. The 21st century classroom requires a new face of teachers with an ICT-compliant status and mindset to support the teaching processes. New technologies bring fundamental changes to the lives of 21st century learners, who are the most frequent users of emerging technologies and online service (OECD, 2016). To key into global best practices in education, FRN (2013) stated that, teaching and learning should be activity-based, learner-centered and experimental as well as Information and Communication Technology (ICT) supported. The emerging technology concepts include the internet back-bone as well as other electronic media devices and facilities that ensure E-learning. Such as broadband desktop, laptop, tablets, smartphones and other hand held devices, wide range of electronic technology devices such as radio, cassette tapes, audio streams, downloadable packages, internet services, television, Ipads, interactive boards etc.

The United States National Technology Plan recommends the need to have a common set of teacher educators who prepare teacher candidates to teach with technology (United States Department of Education, Office of Technology, 2017). According to Onyia and Offorma, (2011), successful adoption and usage of ICTs in education is fundamental to the paradigmatic shift in both content and pedagogy that is at the heart of

education reforms in 21st century. Several authors and documents have posited in affirmation, the invaluable importance of the emerging technologies (ICT) in the classroom. It may be effort in futility if the teacher education is not practically approached, positioned and engaged through availability, accessibility and competency in the emerging technologies. Teacher Education programmes shall be structured to equip teachers for effective performance of their duties. Information Technology (ICT) training shall be incorporated into all teacher-training programmes (FRN, 2013). Yang (2008) in a case study "Examining university student's and academic understanding of ICT in higher education at Curtin University of Technology, reported that teachers who received support from administrators had a high commitment to the adoption of ICT in teaching and learning. Also IDTL (2015) review revealed that more effective use of digital teaching to raise attainment includes the ability of the teacher to identify how digital tools and resources can be used to achieve learning outcome on the ability of teachers and adapting their approach as well as having knowledge and understanding of the technology.

The successful integration of ICT into the classroom depends on the ability of teacher to structure their learning environment some non-traditional way, managing technology with new pedagogies to develop active classroom that encourage cooperative, interactive, collaborative learning and group works (UNESCO, 2008). The challenges for the 21st century teacher in the face of the emerging technology lies in using technologies to innovate teaching and learning, while still maintaining a focus on excellent pedagogy (Paniagua and Istance, 2018). According to Organisation for Economic Cooperation and Development (OECD, 2018) to meet these challenges, teachers need to be provided with appropriate software and training that provides technological knowledge and teaches them to incorporate this in their lessons.

Emerging technologies and emerging teachers

Teacher education in the 21st century classroom depends on the emerging technologies to be relevant in the global perspective in education. To successfully discuss the emerging technology issues, teacher education should be addressed on the bases of availability, accessibility and competency of the emerging technologies. The modern classroom requires a variety of instructional strategies and facilities to add value to the traditional methods, by integrating today's technological devices across all content areas in the school system. The emerging technology is changing the narratives in the teaching learning processes. Obviously, more technologies are emerging and upgrading by the day. This also implies that teachers in the 21st century classroom should

upgrade themselves along the emerging technologies phenomenon. The number of emerging technologies available to support teaching and learning is growing exponentially (Annemieke et al., 2012). According to the authors, a major issue for faculty and educational developers in higher education is to determine which e-learning technologies is most appropriate to support their particular teaching needs and provide optimum learning opportunities for students. As time goes by, more Technologies are emerging and are usable in teaching and learning process. Facebook and other social media now permeate teaching and learning spaces (Orton, 2009; Thinwane, 2010). Brewer et al. (2001) suggests that "ideally, technology plays a transparent supporting role in the learning process; appropriate integration of learning technologies casts technology in the background. However, the authors opined that gratuitous and or awkwardly or inappropriately employed learning technologies can actually juxtapose the role and importance of technology allowing it to compete with the learning process. More awareness are necessary for teachers on the available emerging technologies so as to get them informed and familiar on how best myriads of technologies can be appropriately utilized, consistent with teaching strategies, learning styles and learners' backgrounds.

Recently a new phenomenon has emerged to further support teaching in the 21st century classroom. It is called fifth Generation of wireless technology (5G). Alexis and Erica (2018) posited that a 5G-enabled classroom could include: A holographic teacher who can beam in to lead discussions on specialized topics; seamless virtual reality experiences that can help students with diverse learning needs before engagement, or connected devices that could help close gaps in education for students. Also, Zhi Hao Chung a spARK team's founder came up with mobile AR platform that allows educator to search for and upload lesson plan which can then be turned into interactive and multi sensing learning experiences for students. As the students learn, the platform uses technology to listen in on students' progress and provide comprehensive feedback for teacher which can improve future lessons. Experts in the field of communication technology are making efforts to apply Artificial Intelligence (AI) to support teaching process especially in storytelling. An Ai software IVOW aims to help lower bias in algorithmic identification. To achieve this, it leverages a wide network of international researchers, cultural storytellers and local resident of a particular place to train voice-enabled bots like Apples Siri, Google Home and Amazons Alexa to respond to cultural inquiries and share stories that are more authentic to cultural traditions. Alexis and Erica (2018) concluded that of the many emerging technologies NYC media lab explores, a few in particular stand out as keys to building the classroom of the future. 5-A technology and edge computing will reshape education with lightning speeds. Mobile AR, VR,

and voice technologies are creating more interactive learning experiences. And Ai-powered education platforms can help to improve students' engagement with global culture and history. The emerging technologies come with its attendant challenges; accessibility, competency and mindset syndrome. By implication availability draws its strength from accessibility and vice versa. What if the devices are available and the teachers cannot access them and vice versa. Where the devices are available and accessible, are teachers competent and of the right frame of mind to use the devices for their teaching process?

These issues call for serious concern in the face of emerging classroom in the 21st century. Ely (1999) posited that teachers find it particularly challenging if not impossible to integrate technology when the technologies they would like to use are either not available or not easily accessible to them or their students. In most cases even with adequate access to the E-learning technologies teacher also not always integrate them for their teaching purposes, owing to either lack of competency and or mind set syndrome. Harris et al. (2009) highlighted three basic methods to ameliorate the availability, accessibility and competency challenges, through professional development namely; (a) developing technological skills (b) increasing support through collaboration environments (c) providing increased mentoring.

(a) Developing technological skills: This approach is intended to help teachers gain experience and confidence with technology, as well as provide them with models for how it might be used effectively.

(b) Increase support through collaboration: Professional development needs to emphasize the ability of teacher to share their emotions as well as knowledge. Most collaborative environments typically only emphasize knowledge sharing when emotion sharing may be linked to effective professional development.

(c) Providing increased mentoring: Technology can support mentoring and improve teachers' technology integration attitudes and practice (Gentry et al., 2008). As government and other education providers are demonstrating willingness to utilize maximum advantages of the emerging technologies to enhance classroom activities, the 21st century teachers should be prepared to make themselves available to take advantage.

Forms of emerging technology

Emerging technologies can be classified according to the senses they engaged during the teaching learning processes namely Aural Instructional Media; these are technologies that stimulate the sense of hearing, such as radio, phones, tapes and cassettes, audio discs and

audio compact discs, record players, public address system amongst others. Visual media technologies stimulate the sense of sights. These are the most widely used in our classroom (Etim, 2006). They can be projected and non-projected visual materials. The projected technologies include slides films, film strips, transparencies, etc.

Audio-visual technologies are those that can transfer and transmit learning experiences through seeing and hearing simultaneously. They combine both sound and vision at the same time. They include: television, close circuit television, all film types example 8 mm time, 16 mm, films and 35 cm and the projector machines such as, films projectors, video machines, video tapes.

Types of emerging technologies

Emerging Technology types may vary according to one's perception on these materials. It may also vary according to design example high and low technologies, classification by utilization, hardware and software technologies (computer), projected and non-projected, electronic materials and gadgets such as radio, audio streams, internet, Ipads, interactive boards, other hand held devices etc.

Impact of technology use on teachers in the classroom

Technology use in classrooms by teachers has really had great impact in teaching and learning in recent times. These impacts amongst others are outlined below:

- Electronic technologies such as interactive boards, multi-media devices and television reduce the task and concentration from teachers to the screen.
- The teachers can teach multiple learning tasks and learners at the same time, through online presentation on the internet, within and outside classroom.
- The teacher can organize virtual field strips for students through internet facilities.
- The teaching process can engage multi-sensory approach simultaneously, such as television, multimedia, interactive screen etc.
- The use of emerging technologies can increase teacher's efficiency, saves energy and cost.
- It creates room for interaction between the learners and the teacher – this may promote teaching and learning effectiveness.
- It provides bases for immediate feedback, though voice technology, social media, upload and downloadable packages, of various learning contents.

Impact emerging technologies on the students

- It helps students in individualized learning: students can

use their personal computers or other hand held device to engage themselves in individualized learning.

- Through internet and social media platforms, students can share learning tasks and discover solutions through interactivity and co-operative learning.
- Students can engage in Virtual Field strips on their own to learn, before and after the class interactions.
- Students can undertake courses or learning content not available in the classroom.
- Emerging technology devices breaks learner's background syndrome, students can learn on their own pace.
- Artificial intelligence (AI) brought by the emerging technologies helps in multicultural learning.

Impact on the society

Through the functionalities of emerging technologies,

- The public can access and assess the curriculum on-line.
- The public can access and assess the activities of various institutions.
- Can view performance index of institutions.
- Through emerging technology services the public can make contributions, support services, materially, financially and intellectually to schools.
- Parents, government, donor agencies can view performance index of students and the teachers.

CHALLENGES TO TECHNOLOGY USE BY TEACHERS IN THE CLASSROOM

Emerging Technologies use in the classroom situation comes with its attendant challenges to teachers. Studies have revealed varied degree of efforts put into solving the challenges that exist in integrating technologies into education. Some of the challenges, according to Badri et al. (2013) include, budgetary and some are related to skills, attitude and experience. Other challenges according to the study, includes lack of computer, lack of time, technical difficulties, poor funding, resistance to change, poor administrative support, low levels of computer literacy, technology misaligned with the curriculum, lack of incentives, poor training opportunities and lack of vision as to how to integrate technology into learning processes and teacher related difficulties such as negative attitudes, belief and unwillingness towards technology.

Issues that hinder technology use in schools include social and moral ethics like question of inequitable access to technology for all students, which causes some teachers to avoid requiring students to use of technologies to do assignments. Many schools also find it necessary to restrict the use of various technologies due to potential negative consequences and ethical

dilemmas, considering it a moral imperative to monitor internet use and limit students' access to this technology (U.S Department of Education, 2002). Studies have revealed that in most educational institutions, some teachers are intimidated by technology and are very comfortable with their own established teaching methods. Teachers feel threatened by loss of control in the classroom as students who are usually more adept at using technology can quickly access information and challenge the teacher's role as the primary source of information (Hennesy et al., 2010). Other challenges to emerging technology use by teachers include:

- Pedagogical implications.
- Impact on the instructions and contents of curriculum.
- Availability of technology resources for teachers for teaching purposes.
- In most cases where some of the resources are available, accessibility by teachers for their day to day instructional activities becomes a challenge.
- Teachers expertise and lack of knowledge (competence) to use and to evaluate the role of emerging technologies, prominently hinders teachers' readiness and confidence in integrating emerging technologies in the classroom.
- Poor policy framework by government and various institutions.
- Lack of motivation by the government and the administrations.

SOLUTIONS AND WAYFORWARD

For effective integration of emerging technologies to take place, the following steps are to be adhered to:

- Teachers need to change their role and class organization and also invest their energy in themselves and their students to get ready to introduce and manage new learning arrangements brought by the emerging technologies.
- Teachers need peer collaboration and to learn from one another's innovations and experiences
- The policy framework of the government and various educational institutions should embrace incentives and personnel development of teachers in ICT
- Emerging technology devices should be made available and accessible by various institutional administrations for teaching and learning purpose.

CONCLUSION

Teacher Education in Nigeria is backed by the Nigerian government through legislative mandates and policies as a profession. However placing the policies and various legislations side by side the reality, portends a gap that needs to be filled, through pragmatic approaches to

policy implementations. Technologies are emerging and upgrading daily, putting the classroom of the 21st century always at alert and engaging. Teachers today must be prepared to be developed and be relevant in the new classroom, by improving their knowledge, skills and competency in the use of emerging technologies for their teaching processes.

RECOMMENDATIONS

- Government policies and legislations should ensure availability, accessibility, professional development, motivation, monitoring and evaluation system, in practical terms.
- Teachers should make efforts to develop themselves in the use of the emerging technologies for their teaching purposes.
- Teachers should consider improvisation principles in their instructional activities, power bank and micro solar power devices, makes the no-power-poor power supply complains a less issue.

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