Challenges and Prospects in ICT Integration in Teacher Education in Nigeria

Dr. Yakubu Peter Abuh[1], Dr. Mrs Bibiana Mwuese, Penda[3], Dr. Mrs. Christina Tanko Audu[3]

[1,2] Department of Science Education Federal University, Lokoja.

[3] Department of Science Education, Taraba State Galingo, Taraba State, Nigeria.

ABSTRACT: Information and communication technology has a very significant place in the education process that involves teachers and instruction. This paper therefore, focuses on the challenges and prospects of ICT integration in the teaching and learning process and use of ICT in Nigeria education system. The paper further explore the place of ICT in teaching and learning, importance of ICT integration in education and theoretical models for successful implementation of ICT in teacher education which include the transmission models which concerns itself with drill and practice, the learner centered model, which emphasizes the learner to be given the opportunity to explore and discover concepts on the ir own while the participatory model advocates for learning activities to be carried out in social environments. The paper therefore concludes that everything of human endeavor is at the mercy of ICT tools. This is because ICT has been commonly accepted and proven to been engine for the 21st century and beyond as it is capable of charting the economic, religion, cultural, legal and social life of nations, particularly that of emerging economics through speedy information transmission, high level decision making reduced cost in resources and vast opportunities for information sharing which is accepted as an imperative pattern. This therefore calls for proper teacher training in ICT in this era and its subsequent application in instructional delivery .This paper therefore, recommend among others that integration of ICT in teacher education should be the focus of government, as the will not only increase the quantity of teaching and learning in schools and colleges but also bring about motivation of the young children to learn.

INTRODUCTION

In order to achieve the goals of teacher education programme in Nigeria, there is a need for ICT integration so as to enable both pre – service and in – service teachers acquire ICT skills for effective service delivery in this century. ICT integration in teacher education is very necessary because it will enable the teachers to develop and use computer based lessons for effective teaching and learning (Abuh, 2019). The role of technology in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary education policy (Carlson & Firpo, 2019). Most experts in the field of education agreed that, when properly used, information and communication technology hold great promise to improve teaching and learning in addition to shaping workforce opportunities. Policao (2016) has indicated that computer illiteracy, has actually gingered a new strong desire to equip schools with computer facilities and qualified personal necessary to produce technologically proficient and efficient students in developed countries of the world. There is no doubt that computer can aid the instructional process and facilitate students' learning. Many studies have found positive effect associated with technology – aided instruction (Fitzgerald & Warner 2018)

The professional growth of teachers who are equipped with the professional competencies and growth will enhance motivation, sensitivity, conscientiousness and success to effectively handle the learner professionally and effectively for greater academic achievement. To this end teacher training becomes important to enable the teacher demonstrate adequate knowledge and understanding of the structure, function and development of their disciplines.

The importance of ICT in teaching and learning

In the views of Adam and Onu (2015), the following major areas suggest and range of application that computer can serve teacher and learners in Nigeria:

First, computer can enhance education efficiency. The efficiency in teaching various subjects could be improved. For instance, in Nigeria, teachers are already teaching large classes of student. In the situation, student no longer receive the much desired individual assistance. Furthermore, it is possible to use carefully prepared computer programs to ensure the learners are accurately and systematically intruded. Also, the computer can enhance problem-solving skills of the learners by focusing on thinking skills especially in subject such as mathematics.

Secondly, computers can serve storage and retrieval functions. They can replace the laborious exercise of filing papers in filing cabinets and shelves where records accumulate dust over a long period of time. Another administrative application of the computer is their use for budget planning, accounting for expenditure, writing correspondences and reports, assigning student to classes, reporting student progress and testing student and scoring tests which help to reduce paper work. It is true that many of the tasks above are not effectively and efficiently done in Nigeria schools.

Thirdly, computers can be used for individualized learning, due to large classes and difference in individual learning style and pace, microcomputers will enable the student to progress at his or her own pace and receive continual evaluation feedback and corrections for error made. In this way, computers allow the development of partner-like interactive and individualized relation with the user. Computer plays the role of the tutor and present the leaner with a variety of content and symbolic modes.

Fourth, computers can change current pedagogical practice in school in Nigeria, which depended heavily on the traditional lecture method. It is universally accepted that computers allow more independent exploration, more personally tailored activities, more network, and more significantly, less didactic instruction. The role of the teacher, therefore, changes from information dispersion to that of information manager, from authoritative source information to guided self-propelled exploration (Adah 2019)

Fifth, computers will offer the Nigeria teacher improvement in the techniques of research. The cumbersome exercise of searching by hand library's card catalog or periodical indexes can be made easier by typing few key words pertinent to the research topic into a computer and the researcher can receive extensive list of related sources of articles in books and journals on just a matter of minutes.

ICT and Teacher Education in Nigeria

Teacher education refers to the policies and procedures designed to equip prospective teachers with the knowledge, attitude and skills they equip to perform their tasks effectively in the classroom, school and wider community. Teacher education is also the provision of professional education and specialized training within a specified period for the preparation of individual who intend to develop and nurture the young ones into responsible and productive citizen. It is a pre-planned, articulated set of event and activities which a will be teacher or a teacher-trainer acquire appropriate knowledge, skills, the right type of attitudes, habits and competences needed to be able to enter the teaching profession and to becomes a resourceful, effective and efficient teacher.

Today, the use of ICT has become an integral part of everyday life. Using programme is therefore a necessity. This will enable teaches see the importance of developing and using computer based lessons in their own teaching. It is expected that the 21st century Nigeria teachers should be technologically literate. The school curriculum itself should change to meet the challenges of the information age. As a result of this rapid generational change, teacher educators should be dedicated to preparing a new breed of teachers who will utilize ICT in a dedicated and meaningful way to facilitate active learning. To produce these calibers of teachers requires a deliberate effort on the part of the trainee teachers. They should overcome their own technophobia. If it is essential that pre-service and in-service teachers have basic ICT skills and competences, teacher education institution must provide the leadership role. The world of teaching and learning is changing progressively Osage (2017) is of the opinion that, as technology is creating changes in all aspect of our societal life, it is also changing our expectations of what student will learn, how and where they will learn it so as to function effectively in the new world order. The student will need to be lifelong learners, collaborating with others in accomplishing complex tasks and effectively using different system of representing and communicating knowledge to others. A shift from teacher-centered instruction to learner-centered instruction will be needed to enable student to acquire the 21st century knowledge and skills. In planning for the infusion of ICT into teacher preparation programmes, certain factors must be considered, namely, knowledge of computer operation, competencies in Microsoft excel, competencies in internet browsing, and competencies in e-mail.

Integrating ICT into Teacher Education

A study by Anebi and Okwo (2020) On restructuring of curriculum through the integration of ICT best practices, revealed that unless the curriculum is renewed by incorporating modern technologies of teaching and learning in our educational system, teacher education stands the risk of producing learners who are not well-grounded, not critical thinkers, problem solvers, competent and those who cannot contribute effectively to the immediate society.

The existence of technology can set a pace for achieving global standard in education. This poses increased demand on teachers who are vested with the task of meeting the challenges of integrating the new technologies into teaching and learning. This

also in turn compels teacher training institution to undergo rapid changes in the structure and content of their course to accommodate the new global standards. As posited by Asogwa (2020) teacher training programmes should not constitute only introductory computer courses which do not permit student to sufficiently acquire any skill in ICT. Practical integration of ICT into teacher training should encompass courses on the use of computer application software's for teaching topics in the various subject areas; practical use of multi-media in enhancing lesson delivery: internet surfing and information locating and retrieval. Emphasis on the integration of ICT in teacher education should not only be on skill acquisition but also on the pedagogy behind the effective use of the technologies. Skill in pedagogical uses of ICT in the various subject area should be possessed first by teacher trainers to effectively by role models in demonstrating how ICT can be used effectively in teaching and learning.

Educators who are "skilled in the use of technology for learning and are consistently exposed to professional development in the use if the changing technologies for teaching and learning is an essential condition for implementing ICT in the teacher education" (UNESCO. 2016) The ICT, no doubt, is of immense significance and benefit to the teacher and to the education process. According to partridge (2006), the computer can accurately make a myriad of decision necessary to the planning and implementation of individualized programme of instruction on a mass basis in almost no time. This is an encouragement in the use of ICT in the teaching and learning process, especially as it could allow network users share common resource via inter-computerized connection ranging from the local area network (LAN), the wide area network (WAN) to the world wide web (WWW) or the internet.

Njoku (2018) agrees that the computer technology encapsulates everything that has to do with the development of man his environment. Teacher education curriculum can only achieve relevance if interlaced with the ICT package. The ICT innovation appears more readily equipped to demystify most of the problem confronting the traditional education system with the objective of making teaching-learning experience less stressful. Computer have made it easier and faster for student to access information online, store written works, experiment with ideas and share or compare with other student. The clamor for ICT in education is yet to yield the desired result. However, many education institutions have through government assistance and private sector donation or independently strive to provide ICT facilities for the use by staff and student. ICT integration must not only revove around physical provision of the required technologies and infrastructure, there should be enlightenment, training and capacity building of the teacher educators on the effective use of the new technologies. This forms the basis of a sound foundation for ICT implementation in teacher education.

Okebukola (2017) noted that the ICT initiatives in teacher education institution in Nigeria have not been as successful as exceptive. The potential of ICT on the effective delivery of educational services appear not to be maximally harnessed, as most teacher education institution seems unable and ill prepared to face the challenges of ICT. Esu (2015) stresses that the attainment of a functional and qualitative education will be a mirage without adequate and well trained and qualified teachers to meet the challenges of the school system vis-a-vis computer age and globalization syndrome in the 21st century. Therefore, the knowledge of ICT should be considered as a pre-requisite to become an effective teacher in this 21st century. It should be the first duty of the teacher training institution to provide opportunities for the student-teachers to acquired necessary ICT skill while in training. Admittedly, ICT can make instructional process more infective and productive through the provision of the variety of tools to enhance and facilitate teacher's professional activities in several ways. These ways include e-learning, online learning or internet, information literacy, digital virtual library and assessment, e-mail, web delivery and virtual teaching.

Approaches to ICT integration in teaching education.
the following are the various approaches of ICT integration in teaching and learning process:
(a) Power-point: in any institution preparing teachers, the instructors should use power-point presentation and smart board technology. it is use either to present course contact or student work. These tools often allow interesting and engaging classroom presentations.
(b) Video final examination: this is a non-traditional assessment in which pre-service teachers critique and analyzed a video chip in a chosen topic. In a well ICT equipped laboratory, a student teacher is expected to plan, the critique his lesson. This could be done well with computer word processing skills. During micro-teaching, video chips of students should be played back for them to see their performances and correct their mistakes.
(c) Tape recording tutoring: pre-service teachers are expected to record session and analyses what happens during the session. Digital voice recording is also encouraged and used by the student teachers. Student teachers are expected to reflect on what they have done and this will help them to develop''
   i) A better understanding of the teaching process.
   ii) Stronger pedagogical skill
   iii) Improved attitudes toward the teaching – learning process.
Message board: the message board helps students and teachers to communicate online about course assignment, to clarify course requirements, and to share importance resources to supplement face to face classes. Message boards contain the following.
   i. Students' interaction for the purpose of sharing though.
   ii. Relating idea to past experiences

    iii.   Collaborating with friends

    iv.   Actively constructing their own meaning

    v.   Incorporating the diverse perspective of others

A pre – service teachers, who is knowledgeable in the above tools, will be effective in the classroom instruction, if the ICT resources are available. Moreover, the following models are important to the teacher towards successful application of ICT in teaching and learning.

Bottino (2016) outlines three models for integrating ICT into the Curriculum. They include the transmission Model; learner – centered model and the participative model. The transmission model is nothing else but the drill – and practice programs that are used to assist leaners with development of limited abilities together with tutorial systems that substitute teachers as transmitters of knowledge. The learner – centered is based on the interest that learners learn more when given the opportunity to explore and discover accept on their own. This means considering active exploration and personal construction of knowledge rather than acquisition of knowledge. Lastly, the participative model is where learning activities are organized to take place in a social environment (Bottino, 2004). Bttino confirms the relationship between the learning principles and the use of computers in the classroom in all the models.

Challenges of ICT integration in Nigerian Educational system.

In the view of Oduwa (2018) there are several impediments to the successful use of information and communication technology in the Nigerian educational system. As outlined bellow:

Cost

The price of computer hard word and soft word continues to drop in most developed countries, but in developing toaching-learnig process.

Countries, such as Nigeria, the cost of computers is several time more expensive. While a personal computer may cost less than a mouth's wages in the United state, the average Nigeria workers may required more than two years' income to by one. Many of the school in Nigeria lack adequate infrastructure such as classrooms and only few are equipped with television or radio. Apart from the basic computers themselves, other cost associated with peripheral such as printers, Monitors, Paper, modem, extra, disk drives are beyond the reach of most school in Nigeria. Most school cannot also afford the exorbitant internet connection fees

Weak infrastructure

In Nigeria, a formidable obstacle to the use of information and communication technology is infrastructure deficiencies. Computer equipment is made to function with other infrastructure such as electricity under "controlled condition'' for the past years Nigeria has been having difficulty providing stable and electricity supply to every nook and cranny of the country without success. Currently, there is no part of the country, which can boast of electricity supply for 24hours a day except probably areas where government officials live. There have been cases whereby expensive household appliances such as refrigerators, deeo freezers and cookers have been damaged by upsurge in electricity supply after a period of power outage. Electronics equipment such as radio, television, video recorder and even computer has-been damaged due to irregular power supply. When electricity supply is not stable and constant, it is difficult to high-tech equipment such as computer functioning, especially under extreme weather condition as obtained in Nigeria. The high levels of dust during the dry season in Nigeria also make electronic equipment to have short live span.

Lack of practical skills

Nigeria does not only lack information infrastructure, it also lacks the human skills and knowledge to fully integrate ICT into educational system. To use information and communication technology (ICT) in Nigeria educational system, the need for locally training workers to install, maintain and support this system cannot be over emphasized. There is acute shortage of trained personnel in application software, operating system, network administration and local technicians to service and repair computer facilities. those who are designated to use computers in Nigeria do not receive adequate training at worst; do not receive any training at all (Okchuko. 1997).

In Nigeria also, most teachers lack the skills to fully utilize technology in curriculum implementation hance the teaditional chalk and duster approach still dominates in school pedagogy. Information transfer using ICT is minimal or non-existence in Nigerian school (2003). Teacher in Nigerian need to be trained on educational technologies and the integration of computers into classroom teaching. According to Esu (2005), teachers need effective tools, techniques, and assistance that can help them develop computer based project and activities especially designed to raise the level of teaching in reqired subject and improve student learning.

Lack of relevant software

There is doubt that the ultimate power of technology is the content and the communication. Through, software developers and publisher in the developed countries have been trying for long to develop software and multimedia that have universal application, due to the differences in education standards and requirements, these products do not integrate into curriculum across countries. Software that is appropriate and culturally suitable to the Nigerian education system is in short supply. There is a great discrepancy between relevant software supply and demand is developing countries like Nigeria. According to Solomon (2019), there

are clear indication from many countries that the supply of relevant and appropriate software is a major bottleneck obstructing wider application of the computer. Even if Nigeria tries to approach this software famine by producing software that would suit its educational philosophies, there are two cost of producing relevant software for the country's educational system is enormous. Second, there is dearth of qualified computer software designers in the country. To overcome this people need to be trained in instructional design.

Limited access to the internet

In Nigeria there are few internet providers that provide internet gateway services to Nigerians. Many of these companies provide poor services to customers who are often exploited and defrauded. The few reputable companies, which render reliable services, charged high fees thus limiting access to the use of the internet. The greatest technological challenge in Nigeria is how to establish reliable cost effective internet connectivity. In a country where lonely about 0.6% of the populace has home personal computers, the few reliable internet providers who have invested huge sum of money in the business have a very small clientele. They have to charge high fees in order to recoup their investment in reasonable time. Nigeria has about 500,000 internet subscribers. Secondary schools in Nigeria are not given adequate funds to provide furniture, requisite books, laboratories and adequate classrooms let alone being given adequate funds for high-tech equipment (computers) and internet connectivity.

Suggestions of the way forward
1. Integration of ICT to teacher education should be the focus of government, as this will not only increase the quality of teaching and learning that takes place in schools and colleges but also bring about motivation of the young children to learn. Adequate recognition should be given to the nation's educational sector in terms of adequate budgeting to encourage research, teaching and community development.
2. More attention has to be given to the education sector by government by recruiting quality teachers and prioritizing their welfare so that they will be motivated to do their job.
3. Government should involve teachers in the implantation of its policies.
4. A strong synergy should exist between teacher education and the act of governance. This will encourage teachers to also contribute their quota in governance and at the same time make teachers effective implementers of government policies.
5. Government should improve on physical infrastructure in school and encourage quality teaching and learning through the acquisition of relevant apparatuses and materials.

CONCLUSION

There is no doubt that teachers and student in Nigerian schools will have incredible resources available if they have access to internet. By integrating information and communication technology into school curriculum, fundamental shift in the way teacher teach and student learn will be evolved. However, to integrate computer into teaching and learning in Nigeria, there must be proper and adequate funding and financing of education. There has been a steady decline in government's budgetary allocation to education over the past years. The greatest challenge to the state and federal government is to ensure that budget cuts resulting from dwindling revenue and the need to satisfy other sectors of the economy do not adversely affect education. Nigeria need to invest heavily in the internet business and create enabling environment for students to participate in downloading available and useful knowledge in the internet. teachers and students in Nigeria are already farther behind their peers in developed countries, thus widening the global digital divide.

Nigeria should join the word links of development (world), a program initiated by the word bank in 1997. The program has been establishing computer laboratories and bringing internet connectivity to secondary schools in developing countries around the word. It is also training teachers in these countries to acquire skill necessary to integrate information and communication technology into their classroom practice. The world program link schools around the world in order to improve education, enhance cultural understanding, and develop requisite skills in youth which will prepare them for the job markets in the 21st century, African countries such as Uganda, Senegal, and Zimbabwe are already benefiting from the world program and has improved accessibility and quality of education in those countries.

ICT will continue to refine and define human interaction and social relations of many years to come. In fact, it appears every realm of human endeavor is at the mercy of ICT tools and this seems to continue incrementally ad infinitum, this is because, ICT has been commonly accepted and proven to be an engine for the 2T' century and beyond as it is capable of charting the economy, religious, cultural, legal and social life of nations, particularly that the emerging economies through speedy information transmission, high level decision making, reduced cost of resources/organizational management and vast opportunity for information sharing which is accepted as an imperative paradigm.

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