The Place of ICT in Teacher Preparation and Climate Change Curriculum at the Tertiary Education Level in Nigeria

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Abstract

Education has been acknowledged as the most important factor in sustainable national development. Also, teacher education is a principal factor in the education endeavour. Thus, the importance of quality in teacher education is well recognized in Nigeria as in all education communities all over the world. The Nigerian national Policy on Education affirms that no education system can rise above the quality of its teachers (Federal Republic of Nigeria, 2004). With the coming into existence of Information and Communication Technology (ICT), there is a paradigm shift in the process of teaching and learning. The focus of this paper is therefore to examine the place of ICT in teacher preparation and climate change curriculum at the tertiary education level in Nigeria. There is the need for the quality of classroom instruction to be improved through the integration of ICT into all Teacher Education Programmes in Nigeria. The implication here is that all those involved in the business of training teachers in tertiary institutions should be sufficiently knowledgeable in ICT and how to use it in the teaching-learning process.

Introduction

Before the advent and popularization of ICT, teaching and training of teachers followed the traditional or conventional pattern. The teacher was trained to be a dispenser of information who was expected to meet passive receivers of information (learners). The teacher was believed to posses all that was required to develop the learner. On this, Dike (2008:2-3) asserted that:

> the teacher is looked up as a repository of knowledge, information or data bank that has answers to questions in his field of specialization…the flow of information in this traditional classroom is thus unidirectional –from the teacher to the learner. Such communication is not interactive. It does not allow for "sharing of feelings and experiences" (feedback) which is what communication is all about.

The above practice make teaching teacher –centred However, the coming into existence of information and communication technology (ICT) gave rise to a paradigm shift in the process of teaching and learning. The teacher now enjoys a task relief, democratization of the classroom session, and a healthy network of interaction. He now has more convenient methods and processes of passing across his information and be quickly understood.

Among the challenges facing the teaching profession today is the ICT pedagogical and methodological issues. Information and Communication Technology (ICT) has brought into the educational system newer instructional delivery tools. Such tools are either learning assisting tools, medium of teaching or learning or organization and management tools. Teachers of the 21st century are expected to guide the process of acquiring knowledge by leading their students on how to use ICT facilities in schools. They are to exhibit ICT competencies adequately and effectively in instructional delivery.

While many nations of the world have effectively integrated ICT into the main stream of their educational practices, Nigeria is still providing "Non-ICT –based education". According to Dirsuweit (2009), the existence of various barriers to effective ICT integration in education among the less developed nations such as poor infrastructure, provision of equipment and lack of personnel training, has created a digital-divide among nations. Okebukola (2008), stated that among the gaps worthy of note still existing in teacher education in Nigeria is the need to enhance ICT education. If Nigeria is to be at par with other nations in providing quality education, ICT should form an integral part of our educational practices.

The effective integration of ICT into education requires that teachers be in the forefront of ICT access and usage so that is can impact on their pedagogical skills and thus the quality of education delivery. However, the teacher trainers have the greatest responsibility of setting the pace of competence in ICT usage in education. Until teacher educators model effectively the use of ICT technology in their own classes, it will not be possible to prepare a new generation of teachers who will effectively use the new tools for teaching and training

(Abdultateef, 2008). As we pursue the integration of ICT in the implementation of the National Policy on Education, how proficient are our teacher trainers in these skills?

Concept and goals of Teacher Education in Nigeria

Teacher education refers to the policies and procedures designed to equip prospective teachers with the knowledge, attitudes and skills they require 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 individuals who intend to develop and nurture the young ones into responsible and productive citizens. It is a pre-planned, articulated set of events and activities which are intended to help a would 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 become a resourceful, effective and efficient teacher.

The National Policy on Education (2004) outlined the goals of teacher education as follows:

a)   to produce highly motivated, conscientious and efficient classroom teachers for all levels of our educational system;

b)   encourage further the spirit of enquiry and creativity in teachers;

c)   help teachers to fit into social life of the community and the society at large and enhance their commitment to national goals;

d)   provide teachers with the intellectual and professional background adequate for their assignment and make them adaptable to changing situations;

e)   enhance teacher commitment to the teaching profession.

It further stated that:

Teacher education shall continue to take cognizance of changes in methodology and in the curriculum. Teachers shall be regularly exposed to innovations in their profession.

ICT and Teacher Education

Today, the use of ICT has become an integral part of everyday life. Using technology in teacher education programme is therefore a necessity. This will enable pre-service teachers see the importance of developing and using computer based lessons in their own teaching. It is expected that the 21st century Nigerian teachers should be technologically literate. The school curriculum itself should change to meet the challenges of this 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 caliber 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 institutions must provide the leadership role. The world of teaching and learning is changing progressively. As technology is creating changes in all aspects of our societal life, it is also changing our expectations of what students will learn, how and where they will learn it so as to function effectively in the new world order. The students will need to be lifelong learners, collaborating with others in accomplishing complex tasks and effectively using different systems of representing and communicating knowledge to others. A shift from teacher-centred instruction to learner-centred instruction will be needed to enable students to acquire the 21st century knowledge and skills.

In planning for the infusion of ICT into teacher preparation programmes, certain factors must be considered.

a)   Knowledge of computer operation

b)   Competencies in power-point presentation

c)   Competencies in Microsoft excel

d)   Competencies in internet browsing

e)   Competencies in e-mail

Integrating ICT into Teacher Education

Research studies by Anekwe and Obi (2010) on restructuring of curriculum through the integration of ICT best practices, revealed that unless the curriculum is renewed thereby, incorporating modern technologies of teaching and learning, our educational system stands the risk of producing learners who are not well-rounded, not critical thinkers, problem solvers, competent and those who cannot contribute effectively to the immediate society.

According to the former Minister of Education, Prof. Ruqayatu Ahmed Rufai (2013) in a meeting with task teams on the review of the 4-year strategic plan for the development of the Education Sector, a new teacher education curriculum that is in line with current needs of the education system, has been developed and is being

implemented across our colleges of Education. To further, enhance the quality of training of our teachers, micro-teaching laboratories are being constructed in 58 Federal and State Colleges of Education at a cost of N11.6 billion. This will further go a long way to supporting the integration of modern technology in the teaching and learning process.

Technologies in education facilitate skill and knowledge acquisition, enhance learning opportunities and invigorates learning by making it interesting and exciting and concrete. The existence of these technologies set a pace for achieving global standards in education. This poses increased demand on teachers who are now to meet the challenges of integrating the new technologies into teaching and learning. This also in turn compels teacher training institutions to undergo rapid changes in the structure and content of their course to accommodate the new global standards. As posited by Asogwa (2008), teacher training programmes should not constitute only introductory computer courses which do not permit students 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 areas should be possessed first by teacher trainers to effectively be 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 of the changing technologies for teaching and learning is an essential condition for implementing ICT in the teacher education" (UNESCO, 2002:75).

The ICT, no doubt, is of immense significance and benefit to the teacher and to the education process. According to Singh, Shama and Upahya (2009), the computer can accurately make a myriad of decisions 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 resources via inter-computerized connections ranging from the local area network (LAN), the wide area network (WAN) to the world wide web (WWW) or the internet.

Njoku (2011) agrees that the computer technology encapsulates everything that has to do with the development of man and 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 problems confronting the traditional education system with the objective of making teaching-learning experience less stressful. Computers have made it easier and faster for students to access information online, store written works, experiment with ideas and share or compare with other students.

The clamor for ICT in education is yet to yield the desired results. However, many educational institutions have through government assistance and private sector donations or independently strive to provide ICT facilities for the use by staff and students. ICT integration must not only revolve 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 (2007) noted that the ICT initiatives in teacher education institutions in Nigeria have not been as successful as expected. The potentials of ICT on the effective delivery of educational services appear not to be maximally harnessed, as most teacher education institutions seem unable and ill prepared to face the challenges of ICT. Esu (2005) 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-à-vis computer age and globalization syndrome in this 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 institutions to provide opportunities for the student-teacher to acquire necessary ICT skills while in training. Admittedly, ICT can make instructional process more effective and productive through the provision of a 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 technology integration in teacher education

a)   **power-point presentation**: In any institution preparing teachers, the instructors should use power-point presentation and smart board technology. It is used either to present course content or student work. These tools often allow for 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, teach and critique his lesson. This could be done well with compute 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 sessions and analyse what happened during the sessions. 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 skills

iii) improved attitudes towards the teaching-learning process.

d) **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 thought.

ii) relating ideas to pat experiences

iii) collaborating with friends

iv) actively constructing their own meaning

v) incorporating the diverse perspective of others.

A pre-service teacher, who is knowledgeable in the above tools, will be effective in the classroom instruction, if the ICT resources are available.

Challenges to ICT utilization in Teacher Education

The following challenges are worthy of note.

i) lack of funds for the procurement of computers

ii) Inadequate number of computer specialists to train student teachers.

iii) lack of training, workshops and seminars for teachers on the sue of computer for instruction.

iv) instability of electricity power supply

v) Poor attitude of teachers and learners to the learning of computer.

iv) poor infrastructure and facilities which hinder the conduciveness of teaching and learning task.

vii) low level of technology in the country.

Conclusion

It has become impossible and unthinkable to run teacher education programmes outside the domain and application of information and communication technology (ICT). Its utilization has brought about innovation and revolution in instructional practice especially in the field of teacher education. To achieve effective integration of ICT in teacher education, the professional development of teacher trainers in ICT skills must be among the leading priorities by stakeholder in education.

Recommendations

i) ICT facilities should be customized in every unit and department of teacher training institute and managed by competent personnel to coordinate its use.

ii) Instructional technology centres should be established in the universities and colleges of education. These centres will direct departments on the use of ICT tools and will provide continuous in-service training for teachers.

iii) Intensive computer programme should be mounted for student teachers to enable them become efficient in the use of ICT. To make this possible, computer and internet related assignment be given to the learners to enable them have full grasp of the ICT packages.

iv) The government and teacher training institutions should make it possible for every student to have a compute to ensure constant practice.

v) Electricity supply should be steady and reliable.

vi) Any student that did not pass the computer competency test should not be allowed to graduate.

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