Enhancing Instructional Delivery in Teacher Education through Information and Communication Technology

BY

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Abstract

Teacher education is aimed at equipping teachers with skills and competence to teach and it can take different forms such as pre-service and in-service teacher training. Modern classrooms are demanding that teachers learn how to use information and communication technology (ICT) in their work. The competences learnt by using (ICT) tools rather than simply allow teachers and students to do what they have done before in a better way. How do we help pre-service in using ICT? To achieve this, the paper discussed the native and potential impact of ICT, instructional delivery using ICT tools and the challenges in integrating ICT in teachers' education.

Introduction

Teacher education is a very vital component of most educational system. The fact is that it is concerned with the training of teachers to acquire the competences and skills that will equip them in the teaching task. That is why DuroSaro (2010) refers to teacher education as the exposure of learners to the body of knowledge, attitudes, behaviors and the skills they require to perform their task effectively in the classroom, the school and the wider community. This process consist of a programme designed for improving the pedagogical fitness of teachers for the jobs of educating learner at specified level is of education (Kenneth, 2011). Teacher education is thus an institutionalized procedure for the purpose of organized preparation of not only the present but also future capacity building .from the forgoing, the following can be deduced as the essence of teacher education these are ;

I. Teacher education involves giving professional training to teacher by impacting knowledge, skill, attitude, aptitudes and values desirable in the teaching profession

II. The knowledge so acquired will enable teachers to transmit culture from generation to generation as well as shaping the destinies both individuals and the society at large

III. Teacher education is highly indispensable for a nation that wants rapid development and progress [Maduewesi & Ofojebe,2006]

It is in recognition of the above that the national policy on education [FGN, 2004] highlighted the goals of teacher education to include among others . in order to ensure quality in the teacher education .process, the national policy also stated that all teacher in educational institution shall be professionally trained and that teacher education programme shall be structured to equip teacher for the effective performance of their duties. Added that also the policy noted that teacher education shall continues to take cognizance of changes in methodology and in the curriculum and that teacher shall continue to be regularly exposed to innovations in their profession [FRN, 2004].

The essence of the above goals rest on the fact that teacher have a cardinal role to play to achieving education objectives. Teachers are the human point of contact with students who the teacher is and what he does mediate all other influence on the quality of education. Ebeogu and Ofoefuna (2011) stated that teachers have the potentials for enhancing the quality of education by bringing life to curriculum and inspiring students to curiosity and self directed learning. It is what the teacher thinks, what the teacher beliefs and what the teacher does at the level of the classroom that ultimately shape the kind of learning that young people get (Hargreaves,1995).

In Nigeria today, teacher training occurs at the college of education, faculties of education in universities and polytechnic where NCE graduates are trained as teachers. The National Teachers Institutes (NTI) trains NCE teachers through her long distance learning program while the Teachers Registration Council of Nigeria (TRCN) offers professional diploma in education. Most institute of education in Nigeria

Universities train PGDE graduates for our school system. It thus becomes note worthy that a major determinant of the success of implementation of the structure, programmes and practices of teacher education is information communication technology. Hence, the great need to identify, explain and show how ICT enhancing the various facts of teachers education. Furthermore, there is the need to highlight the challenges of innovation on the teacher education with respect to information communication technology (ICT). This paper therefore discusses the nature and potential impact of information communication technology instructional delivery using ICT tools and the challenges in teacher education. In order to achieve these objectives, the paper is divided into four parts. First, ICT in the pedagogical preparation, second: ICT in content achievements and attitude. Third: ICT in teaching practice and fourth: challenges in integrating ICT in teacher education.

Impact of ICT in Teacher Education

Information and communication technology is the use of electronic means to collect data, process, store, retrieve and make available different types of messages to anybody seeing to get or use it anytime, anyhow and anywhere in the world, for the pursuance of educational advancement (Okoye, 2005). Information communication technology according to Rajaraman (2006) is the technology that is used to acquire, store, organize and process data to form which can be used in specified applications and disseminate the processed data. To sum the term, ICT is a whole range of facilities that involved information processing and electronic communication to be handled with skills and expertise for effective achievement and realization of its potentials in both education and social development. Modern technologies provide a means of improving teaching and learning in the classroom. New technologies have the potentials to support education across the curriculum and provide opportunities for effective communication between teachers and students in ways that have not been possible before (Dawes as cited in Ndirika, 2011).

In an effort to make learning more meaningful and concrete to learners, ICT is contributing actively to classroom instruction, thereby making positive impact on students' classroom achievements. It is evident that traditional education environment do not seems to be suitable for preparing learners to function or to be productive in the work places of today's society faden with various ICT gadgets and technological information. Ibe – Bassey (2011) carried out an examination of the curriculum for the different training agencies and found out that there was no indication that there is a professional development programme that has an ICT based practice/study. While there are many stakeholders involved in ensuring effective integration of ICT in the educational system, teachers have a particular important role to play. According to Carlson and Gadio (2002), teachers are the key to whether technology is used appropriately and effectively. ICT can enhance the quality of instructional delivery in several ways by increasing learner's motivation and engagement by facilitating the acquisition of basic skills and by enhancing teacher training. ICT are also transformational tools which when used appropriately can promote the shift to a learner-centered environment. Appropriate use of information communication technology can catalyze the paradigmatic shift from teacher-centered pedagogy to a more effective learner-centered pedagogy.

Instructional Delivery using ICT Tools in Teacher Education

In this rewarding pursuit as illustrated in the policy reforms in teacher education and development contained in the roadmap for the education sector initiated by Dr. Sam Egwu in 2009, the National Teachers Education policy includes amongst others: Computer literacy and ICT application shall be a requirement for all NCE and undergraduates students. Research has shown that the appropriate use of ICT especially computers and internet technologies-enhance new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way (Bransford, 1999). These new ways of teaching and learning are underpinned by constructivist theories of learning and constitute a shift from teacher centered pedagogy in its worst form characterized by memorization and root learning to one that is learner centered. ICT tools can be effectively utilized in teacher education in the following ways:

ICT in the Pedagogical Preparation

✓ Active learning. ICT enhancing learning mobilizes tools for examination, calculation and analysis of information, thus providing a platform for student's inquiry, analysis and construction of new information. Learners therefore learn as they do and whenever appropriate work and real life problems in – depth, making learning less abstract to make more relevance to the learners life situation.

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In this way and in contrast to memorization based or rote learning, ICT enhanced learning promotes increased learners' engagements. ICT enhanced learning is also 'Just in time" learning in which learner is engaged. ICT enhanced learning can choose what and when they need to learn it.

✓ Access to remote learning resources: Teachers and learners no longer have to rely solely on printed books and other material in physical media housed in libraries and available in limited quantities for the educational needs. With the internet and the world wide web, a wealth of learning materials in almost every subject and in variety of media can now be accessed from anywhere at any time of the day and by an unlimited number of people. This is particularly significant for many schools in developing countries and even some developed countries, that have limited and outdated library resources ICT also facilitate access to resource persons, mentors, experts, researchers, professional business leaders and peers all over the world.

✓ ICT in content Achievement and attitude:
Online collaborative learning .ICT supported learning encourages interaction and cooperation amongst students, teachers and experts regardless of where they are. Apart from modeling real-world interaction, ICT supported learning provide learners the opportunity to work with people from different culture, thereby helping to enhance learner teaming and communicative skills as well as their global awareness. Its model learning is done throughout the learner's life time by expanding the learning space to include not just peers group but also mentors and expert from different fields. Online discussion can be used to foster critical thinking.

✓ Information communication technology has the potentials to widen access educational resources, improve the quality of learning and improve management efficiencies of the educational system. ICT used in education is not all about ICT literacy but it also involves the building of high order skills, i.e. knowing and understanding what it means to live a digitalized and networked society and used digital technology in everyday life.

✓ Motivation to learn ICT such as videos, television and multimedia computer software that combine text, sound and colourful moving images can be used to provide challenging and authentic content that will engage the students in the learning process. Interactive radio likewise makes use of sound effects, song, dramatization, comic skits and other performance convections to compel the students to listen to listen and become involved in the classroom involved in the lesson been delivered.

The use of interactive radio made it very easy for pupils to sequence the events (Singh, 2010). With it, students are bound to work, collaboratively speak and listen to each other while trying to establish the fact of what took place working in pairs, they can compose and send question to their teacher using e-mail. More than any other type of ICT, net worked computers with internet connectivity can increase learner's motivation as it combines the media richness and interactivity of other ICT with the opportunity to connect with the real people and to participate in real world events. Research shows that students using computers were highly motivated to complete their assignments and demonstrated high level of curiosity, achievement, orientation and personal ownership of the project (Bosch Mann, 1995).

✓ ICT Teaching Process: Facilitating the acquisition of basic skills .the transmission of basic skills and concepts that are the foundation of higher order thinking skills and creativity can be facilitated by ICT through drills and practice. Educational television programme such as Sesame Street use repetition and reinforcement to teach the alphabets, numbers, colors, shape and other basic concepts. Most of the early uses of computer were for computer based learning (also called computer assisted instruction) that focused on mastery of skills and content through repetition and reinforcement. This approach has the potentials to enhance learners motivation and acquisition of basic skills needed. Infact, this process will encourage the students to express themselves clearly as they needed to be understood especially by their peer.

✓ Enhancing teacher training. ICT have also been used to improve access to and the quality of teacher training. for example, institutions like the cyber teacher training center (CTTC) in South Korea are taking advantage of the internet to provide better teacher professional development opportunities to in-service teachers. Videotaping microteaching lesson has become the optimal practice because it allowed students to view their performance themselves. Learning is both an active and reflective process. Though, students learn by doing, constructing, building, talking and writing. They also learn by thinking about events, activities and experiences. They learn by experiences that allows them to absorb (read, hear and feel), do (activity) and interact (socialize) (Wertenbroch & Nobeth, 2000). With the use of videotaped microteaching lessons, presenters learn by reflecting in an extended period by linking recent experiences to earlier ones in order to

promote a more complex and interrelated mental schema. In addition, they can also learn by reflecting on such experiences (Dewey,1933)

✓ Online discussion and dissemination of information: This can be described as a comprehensive structure that supports the process of learning through the implementation of a variety of instructional and communication technology. Online discussion also promotes Metacognition, self-evaluation of one's own thinking which is part of the critical thinking process that pre-service teachers should use as parts of their learning and as part of their classroom teaching (Ferding & Roehler, 2003). Active participation in online discussion better prepare trainee teachers to use online discussion in their own teaching when online discussions were integrated into their teacher education courses (Kumar, 2008).

Lecturers have the potentials for enhancing the quality of education by bringing life to curriculum and inspiring students to curiosity and self–directed learning. This is why Collis and Moone (2001) made a distinction in literature between learning about ICT and learning with ICT and through ICT. These distinctions are important if learners are to integrate ICT in their instructional delivery process.

The first stage of ICT application in teacher education is teaching about ICT that is ICT is the topic.
A higher level to that development using a computer which requires the students to interact with the computer in a teaching and learning manner with these modes: Drills –and-practice, modeling, simulation, tutorial and others

✓ Virtual teaching: A situation in which the teacher and the learners interact through video conferencing techniques.

✓ Instructional slides and tutorials (Audio) which are teaching and learning aids made and written into compact disc with graphics and text.

✓ Web based instruction which uses the internet and the world wide web(www) as the main component to learning materials and resources for teaching /learning a course.

✓ Multi-treading a feature of the web that enables different parts of a course material to be connected in any order that makes sense to the students.

✓ Computer managed instruction which uses a tool for organizing instructions with three main components which include test and records. Instructional guidance and resource components.

The Challenges in Integrating ICT in Teacher Education
To achieve success in the application of information and communication technology in teacher education programme. A number of issues must come to the mind towards the use of ICT to create learners centered environment as follows:

✓ There is inadequate ICT manpower in our colleges and universities. Those that are involved in the teacher education programme are reluctant to use ICT because of the lack of knowledge for software design, lack of administrative support, increase time and effort needed to learn and use the technology. Empirical studies have indicated that even teachers who have competence in the use of ICT do not integrate them in their teaching.

✓ There are low infrastructures in many of our colleges and universities. There seems to be ICT connectivity problem in many schools, colleges and universities and this low infrastructure may include : Appropriate rooms and building , effective and accessible electricity and telephone and basic facilities for computer based online learning.

✓ Problem of quality and lack of resources are compounded by the new realities faced by higher educational institution and battled to cope with every increasing student's number. There is little attention paid to content development of software needed for ICT integration of a capacity building of teacher /personal. Ibe – Bassey(2011) opined that there is need to train more ICT based instruction designers , evaluators , scriptwriters, audio and video production specialist, programmers, multimedia course authors and web designers and developers.

✓ Maintenance culture is seriously neglected. Most computers and their tools are packed in colleges and universities because of unskilled technicians.

✓ Poor funding for education facilities is another serious challenge inhibiting the fast and inevitable use of information communication technology.

✓ Nigeria power holdings have continued to keep the country in the dark. A lot of resources and knowledge are abandoned when people are kept without light. It is difficult and expensive to operate the computer without steady power supply or none at all. There is need for the Nigerian

Government to address seriously the issues of the erratic electricity power supply while on the other hand, schools wishing to adopt the integration of ICT in the teaching –learning process should as a matter of urgency procure a generating set or alternative current that can supplement power holding company (PHCN) supply of power.

Conclusion

Teacher education is given prominent in the Nigeria educational system. In line with section 8B (74 & 75) of the National policy on education (FRN, 2004) stated that: Teacher education shall continue to take cognizance of changes in the methodology and in the curriculum. Teachers shall be regularly exposed to innovations in their profession. In – service training shall be developed as an integral part of continuing education and shall also take care of all inadequacies (p. 34). Teacher education is faced with the challenges of preparing a new generation of teachers to effectively use the ICT tools in their teaching practice. ICT has demonstrated a significant positive effect on achievement. For example, evidence suggests that interactive video is especially effective when the skills and concepts to be learned have a visual component and when the software incorporates a research-based instructional design. The ICT application in all the facets of teacher education will go a long way in enhancing instructional delivery and efficiency which will in turn produce teachers that will contribute maximally to the advancement of education. Systematic programmes of acquiring ICT skills for teachers needs to be incorporated into the teachers is adequately prepared for ICT and apply ICT effectively in their professional practices.

References

Adeyanju, O.L (2004). Computer- assisted instruction in I.O Salawu and A.O Afolabi (eds) introduction to Educational Technology Hand book for undergraduates. Oyo: Odumatt press and publisher

Boschmann, E. (1995). The electronic classroom: A hand book for education in electronic Environment. Medford NJ: learned environment.

Dewey, I.(1933). How we think: a restatement of the relocation of reflective. Thinking to the educative process. Boston: D.C. Heath.

Durosaro, D.O.(2010). Teacher education in Nigeria: past, present and future challenges. *The procesetter,* 17(1), 43-44.

Ebeogu, U.M. & Ofoefuna, M.O. (2011). The impact of information and communication technology (ICT) on teacher education . Conference proceeding of the 32rd international conference of Nigeria Association for educational media and technology, September 19-23, Owerri

Federal Republic of Nigeria (2004). *National policy on education* 6ᵗʰ edition. Lagos NERDC

Ferdig, R.E & Roehler, L. R (2003). Students' uptake in electronic discussions. Examine online discussion in literacy pre service classroom: Journal of research on Technology in education , 36(2), 119-136.

Kumar, S. (2008). Using asenchronous online discussion to enhance classroom discussion teacher education courses.

Nwosu, H-& Ogbomo,T. (2011). ICT in education: A catalyst for effective use of information PNLA Quarterly, 75(4).

Omoniyi, T. (2005). *Principles and application of educational Technology.* Ibadan: Bash moses publishers.

Wertenbroch, A & Nabeth, T.(2000) Advanced learning approaches and technologies