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REBUILDING TRUST IN TEACHERS EDUCATION PROGRAMES THROUGH INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGY

Aniekan Elijah Asukwo[1], Chimaeme Ikechi Igbokwe [2], Mohammed Bashir[1], & Muhammed Adamu Yusuf[1]
[1]Department of Electrical Technology Education,
Modibbo Adama University of Technology, Yola, Adamawa State, Nigeria.
[2]Department of Business Education, University of Uyo, Uyo, Akwa Ibom State, Nigeria.

Abstract
This paper gives an insight into how Information and Communication Technology (ICT) surpasses all the methods so far as it is not classroom bounded. The problems that conventional mode of teachers' education could not handle completely such as limited class room, variance knowledge of teachers, government factors among others, is taken care of by information and communication technology. The influence of digital technology in society has made ICT literacy a basic requirement needed by all to survive the challenge of living in the 21st Century. The education industry is now faced with the challenge of helping learners to acquire this literacy, while coping with this challenge requires breeding teachers' with high level of proficiency in ICT literacy and competence

Keywords: Rebuilding Trust, ICT in Education, ICT integration, University Teacher Education, Learning

Introduction
Advancement in computer and internet technology has over the years transformed human society, making the world a global village in the present information age. The impact of this advancement is felt in all spheres of human endeavor as reflected in our socio-economic, political and to some extent the education industry (Onasanya, Shehu, Oduwaiye, and Shehu, 2010). Furthermore, the use of Information and Communication Technology (ICT) has now become an integral part of the human society (Nwachukwu, 2006). This development has challenged the traditional role of the education sector in human society. Now, the education industry is faced with the challenge of equipping the learner with: technology and information literacy; problem solving skills; critical reasoning; and the ability to use digital technology in accessing and utilizing information for problem-solving in addition to knowledge of subject's content. These knowledge components often described as ICT-literacy has become part of the basic labour requirement in knowledge driven societies; and a necessary foundation for higher education and professional development. This development is necessitating a lot of changes in the education industry in an attempt to cope with the emerging challenge of ICT integration in education.

To effectively cope with this emerging challenge of equipping the learner with functional knowledge that bears relevance to the present need of the information (ICT) age, the education

industry need to be transformed at all levels. Such a transformation needs to reflect on meaningful changes in infrastructure, facilities, curriculum and pedagogical practices. The transformational changes must be directed towards: facilitating the integration of ICT in the curricular content of all subject/disciplines and at all levels of learning; the utilizing ICT equipment in pedagogical practices; and other educational practices as applicable to schools, colleges and universities. This would improve teachers' efficacy, enhance teaching and learning while developing learners competence in the use of information technology (Larose, David, Dirand, Karsenti, Vincent, Grenon, Lafrane, & Cantin, 1999; UNESCO 2003). The philosophical basis of such desirable changes must be considered in the interest of the school child who would face the challenge of being engaged with the use of ICT industrially and for his day to day living as an adult in the society (Teo, 2008).

Concepts of Technology Integration in University Teachers Education Program: Definition and Clarifications

Technology: The term technology can be defined in various ways. Hornby (2010) defined technology as a scientific knowledge used in practical ways in industries to design new machines and equipment. Technology is also the modification of the natural environment to satisfy perceived human wants and needs (Information Technology for European Advancement, 2000). Since human needs are insatiable, technology tries to proffer possible solutions to human needs craved by man for continues existence of life. Students in secondary school require adequate use of scientific knowledge to help them develop innovative thinking, creativity as well as research skills (Faizi, Shakil, & Sidra-tul-Muntaha, 2013).

Educational Technology: Educational technology is a type of education that concerns itself about teaching and learning with technology. It involves the use of technology as a tool to enhance effective teaching and learning process across all subject areas. Richey (2008) posited that educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources and aids to improve the progress of human learning. In the words of Faizi, Shakil, and Sidra-tul-Muntaha (2013), Educational technology is a system in education in which machines, materials, media, men and methods are inter-related and work together for the fulfillment of specific educational objective. There are different types of educational technology; most important are PowerPoint presentations, calculator smart board, computer, TV and internet. Through educational technology students develop a wider range of knowledge and understanding of concepts for higher productivity through effective delivery of lessons.

Technology Education: Technology education being the major focus of this review, hinges it thrust in the type of education a group of persons (teachers) receive to enable them become acquainted with the practical use of available technology. It is a study of technology which provides an opportunity for teachers and students to learn about the processes and knowledge related to technologies that are needed to solve problems and extend human potential (Information Technology for European Advancement, 2000). Here, human ability is used to shape and change the physical world to meet needs, by manipulating materials and tools with techniques. The inculcation of this type of education to teachers will invariable revamp the fate

of technology education in secondary schools as the right education that will be geared towards useful living among secondary school students will be given to them for functional development. Technology education develops interest and curiosity among the students. It provides not only theoretical knowledge to the students but also make them professionally skilled in subject by providing practical knowledge. Through technology education, students become aware of their social status by keeping themselves up-to-date and can solve their problems by sitting together for group learning as well as promoting creativity, retention and entertainment to students.

Teacher Education: Teacher education according to Adenike (2012) is a procedure designed to equipped prospective teachers with the knowledge, attitudes, behaviors, and skills required to perform their tasks effectively in the classroom, schools and wider community. The teachers who are responsible for empowering the students to acquire skills and knowledge need to be better equipped with all that can enhance their competences in their respective fields.

Challenges of Technology Education for Teachers in Nigeria

Technology education which is one aspect of teacher education in Nigeria is faced with some challenges which include:

1. Lack of a clear definition and clarification of the concept of technology education: Many educational specialists and stakeholders still confuse educational technology to mean the same as technology education. This misconception and misunderstanding of concept could impair good decisions and bring about wrong application.
2. Globalization: Another challenge emanates from globalization as the world gradually changes to a global village. The impact of globalization and inculcation of information and communication technology into teaching and learning have ushered in some attendance challenges. In the world today, emphasis is now tailored towards science and technology and governed by ever increasing discoveries, invention and innovation. These inventions and innovations is greatly associated with internet and e-mails, video films, iPods, ipads, mobile phones, satellite television stations, supersonic jets, CAD/CAM, the robotics and biotechnologies (Aladejana, 2012). There is a great urge for teachers and students to be ICT compliant.
3. Curriculum context of teacher preparation: Despite the enormous benefits associated with continuous assessment as recommended by National Policy of Education (Federal Republic of Nigeria, 2013), its implementation has been partially undertaken because teachers have not been well trained for it. In this line, Ajevalemi (2015) opined that, an effective teacher of any subject must demonstrate mastery of the subject matter as well as the philosophy and goals of teaching that subject at that level, learning theories, principles and methods and good personality as a leader and positive attitude to the student and the subject matter.
4. Poor political climate: The poor political climate bereft with frequent political unrest and the attitude of student–teachers in our teacher preparation institution constitutes a fear challenge to achieving sound teacher education for effective delivery of technology education in Nigerian secondary schools.

Relevance of Teacher Education in Nigerian Secondary Schools

Teaching is a complex process with numerous variables affecting the quality of instruction and learning, one of which being the job environment of the teachers (Akporehe, 2011). In Nigeria, the need for well qualified teachers has gained much interest in the profession because it is considered that teacher education is a means of not only providing teachers with the necessary skills and knowledge needed to adequately carry out their teaching jobs but also for their professional growth (Osunde & Omoruyi, 2004). Teacher education is the process of training that deals with the art of acquiring professional competencies and professional growth. It is an essential exercise that enhances the skills of learning and teaching. Teacher education is designed to produce highly motivated, sensitive, conscientious and successful classroom teachers who will handle students effectively and professionally for better educational achievement (Ololube, 2005). According to Amedeker (2005), inadequate teacher preparation programs results in majority of teachers' inability to demonstrate adequate knowledge and understanding of the structure, function and the development of their disciplines. Therefore, an effective teacher education program is a prerequisite for a reliant education which leads to a good level of confidence to both the teachers and learners (Lawal, 2003). Teacher's professional growth supports the idea that technology education being embedded into teacher education and training will serve as an important factor in teachers' job performance and development. This is so because teachers' education and training is generally considered to be essential for school effectiveness and improvement (Larose et al., 1999). Creemers (1994) argues that teachers who are bent on improving their competence are likely to contribute, directly or indirectly to the growth of student's achievement. Similarly, studies concerning staff training and education clearly demonstrated the need to offer teachers better opportunity to educate and develop themselves in order to create understanding between their job and their effectiveness.

Need for Pedagogical Shift

For successful technology integration in schools, teacher education programs play a crucial role. Teacher preparation on technologies should provide teachers with a solid understanding of the various media, their affordances, and their constraints. Such understandings can only emerge when teachers are actively involved in teaching and learning with technology across the various disciplines. The idea of teaching a separate course on computing skills, we believe is fundamentally flawed.

Technology skills should not be taught out of context. One can best learn how to use a computer while working on a meaningful task. Teacher preparation should not be based on training for "computer literacy" but should prepare teachers for using technologies to construct, represent, and share knowledge in real life authentic contexts. Teachers should not be taught about technology but how to use technology for constructing, organizing, and communicating knowledge. A long history of technology use in education shows that the first inclination is to use new technology in the same traditional ways as the old technology. Continuing old practices with new technology will neither change nor improve education. Old curricula and pedagogical approaches should be reformed, and if necessary replaced, to take advantage of the affordances of the new media.

Knowledge building results when learners interact with their peers, collaborate, discuss their ideas, form arguments, and negotiate meaning. When used appropriately, technology provides a more decentralized environment where students take more control of the learning

environment and become active constructors of knowledge while working on authentic tasks. Information technologies and computer networks shift the role of the teacher from knowledge transmitter to that of a facilitator who provides opportunities for interaction and meaning making to all learners.

Newhouse (2002) identified significantly the impacts of the use of ICT on students, learning environments, teachers and pedagogy, school provision of ICT capacity, school and system organization and policy and practice. Newhouse presented these in five dimensions:

1. Dimension 1: Students Attributes [ICT capability, Engagement, Achievement of Outcomes]
2. Dimension 2: Teacher Professional ICT Attributes [ICT Capabilities, Vision and Contribution, Integration and Use, Feelings]
3. Dimension 3: Learning Environments Attributes [Learner-Centered, Knowledge-Centered, Assessment-Centered, Cooperation and Collaboration, Reflective Thinking]
4. Dimension 4: School Environment [Leadership and Planning, Curriculum Organization, Curriculum Support, Community Connections, Accountability]
5. Dimension 5: School ICT Capacity [Hardware, Software, Connectivity, Technical Support, Digital Resource Material]

The relationships of these dimensions to each other are represented in the diagram in figure 1.

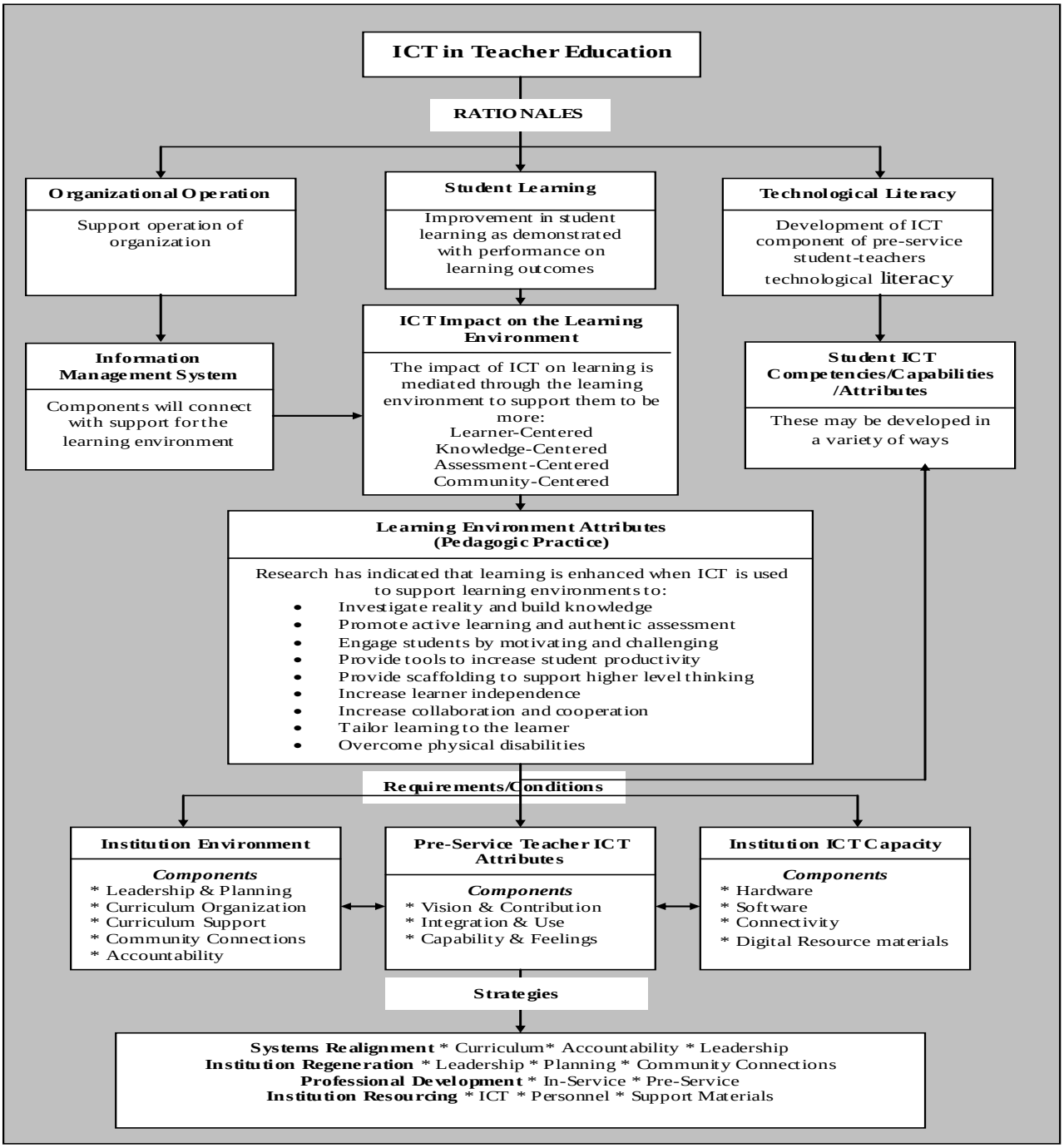

Figure-1: *Schematic Diagram Shows the Relationships between the Dimensions of Impact of ICT in Teacher Education.*

(1) ICT use as Main Content Focus of Teacher Education

Traditional teacher education programs are based on this approach. This approach has an emphasis on teacher training in how to use ICT in the classroom. The student teachers are trained to select appropriate ICT tools and use them in instructional situations. The trainee is expected to

use ICT while teaching depending on the school's ICT infrastructure. In this approach of pre-service teacher education, the student teachers are expected to:

a) be familiar with ICT components, such as computer, internet, computer conferencing, video conferencing etc
b) demonstrate ICT skills
c) integrate ICT into subject
d) be familiar with computer-based instruction
e) familiar with instructional technologies
f) use appropriate instructional technology in the classroom
g) use ICT in classroom teaching

(2) ICT use as Part of Teaching Methods

The main emphasis of this approach is on successful ICT pedagogy integration. In this approach, the student teachers are provided with examples of ICT pedagogy integration. In this approach, trainees learn how to use ICT in their classrooms by actually being engaged in the process of ICT integrated training. They provide examples of real educators and learners using successful practices of technology to support instruction and learning in their classrooms. Trainees access the learning materials and search the useful educational links during the training process and discuss on ICT pedagogy integration with students and teachers. In this approach of pre-service teacher education, the student teachers are expected to:

a) use ICTs to construct, represent and share knowledge in real life authentic contexts
b) use technology for constructing, organizing and communicating knowledge
c) understand the various media, their affordance and their constraints
d) think like experts in making instructional decisions
e) select media for appropriate use
f) structure learning activities
g) employ sound pedagogical strategies in real-life contexts.

(3) ICT as Core Technology for Delivering Teacher Training

In this approach, ICT is used as the major way of providing the learning experience of teacher training. The content of this approach does not necessarily focus on ICT skill itself but rather covers a variety of ICT applications (Jung, 2005). Computer-assisted teacher training, Internet-based ICT teacher training and Internet-based online teacher training are example of this type of teacher training programs, which are successfully going to work in USA. These programs use the internet as the main delivery technology and focus on ICT-pedagogy integration in an online learning environment. In this approach of pre-service and in-service teacher education, the teachers are expected to:

a) develop knowledge of the functioning and the services that the internet or virtual campus of the teaching institutions in which people work;
b) use ICT in teaching as a means of didactic innovation;
c) know the use of ICT in the specific field of knowledge.
d) know the different ICT applications in the educational field.

Teacher Education Programme in Nigeria

The goal of teacher education in Nigeria includes, among others, 'the encouragement of the spirit of enquiry and creativity in teachers, and providing them with the intellectual and professional background that will be adequate for their assignments and also make them adaptable to changing situations' (Federal Republic of Nigeria, 2013). The policy notes that teacher education shall continue to take cognizance of changes in the methods and curriculum, and teachers shall be regularly exposed to innovations in their profession. By the policy stipulations therefore, the professional training of teachers is two-fold: pre-service and in-service trainings. To implement this, certain institutions are charged with the responsibility to provide professional training for teachers. These include:

1. Faculties/Institutes of Education of Univesities: train teachers for secondary (high) schools by offering Bachelor of Education degree programmes to both senior secondary school graduates and senior secondary school teachers who already have National Certificate in Education (NCE) qualifications. They also offer Master's and Doctorate degree programmes in education.
2. Colleges of Education: offer post-secondary NCE training Programmes, i.e. train teachers for primary and junior secondary schools (basic education). The NCE has become the minimum qualification for primary school teaching as of 1998. Some of the colleges also offer NCE pre-primary courses in order to produce teachers for the pre-primary level of Education. The NCE represents a classic design of teacher education in Nigeria.
3. The National Teachers' Institute (NTI): was established to provide refresher and upgrading courses for practicing teachers; organize workshops, seminars and conferences as well as formulate policies and initiate programmes that would lead to improvement in the quality and content of education in the country. In pursuit of these responsibilities, the institute initiated training and re-training programmes for helping unqualified primary school teachers. Recently, the institute also embarked on the Nigeria Certificate in Education (NCE) programme through a Distance Learning System (DLS). It also provides training for the Pivotal Teachers Training Programme (PTTP) by means of a distance learning system, which was introduced in 2002 as a means of producing teachers to fill the gap in teacher supply for the Universal Basic Education (UBE) programme.
4. Schools of Education in the Polytechnics: offer diploma programmes for the production of teachers for technical and vocational colleges.
5. National Mathematical Centre and the National Institutes of Nigerian Languages: organize specialized training in content and pedagogical skills for in-service teachers. They also develop instructional materials for use in schools.

The requirements for the various teacher-training programmes differ from one level to the other in terms of academic qualification. For admission to colleges of education, prospective candidates must have at least three credits in the Senior School Certificate—including the subjects they want to study—and two other passes. At the university level, the entry requirement is five credits, which must include the chosen major teaching subject.

ICT as a Tool for Rebuilding Trust in Teacher Education

ICTs would be able to provide requirements to educational development in Nigeria and there are now many outstanding examples of world class settings for competency and performance-based technologies. The policies of education have been inadequate for over time and have not been able to meet its purposes due to limitation while ICTs have proven to be better and has taken care of those limitations. This new technologies will continue to drive various forms of learning further. As students and teachers gain access to higher bandwidths, more direct forms of communication, access to sharable resources, and the capability to support these quality learning settings will continue to grow. Conventional teaching has emphasized content and for many years, courses have been written around textbooks. Teachers have taught through lectures and presentations interspersed with tutorials and learning activities designed to consolidate and rehearse the content.

Another way in which emerging ICTs are impacting on the content of education curricula are from the ways in which ICTs are dominating so much of contemporary life and work. Already, there has emerged a need for educational institutions to ensure that graduates are able to display appropriate levels of information literacy, "the capacity to identify and issue, and then to identify, locate and evaluate relevant information in order to engage with it or to solve a problem arising from it". The drive to promote such developments stems from general moves among institutions to ensure their graduates demonstrate not only skills and knowledge in their subject domains but also general attributes and generic skills.

Traditionally generic skills have involved such capabilities as ability to reason formally, to solve problems, to communicate effectively, to be able to negotiate outcomes, to manage time, project management, and collaboration and teamwork skills. The growing use of ICTs as tools of everyday life have seen the pool of generic skills expanded in recent years to include information literacy and it is highly probable that future developments and technology applications will see this set of skills growing even more.

Summary

This paper establishes integration of ICT in Teachers Education as a necessity which very serious thoughts should been given to, since different methods have been employed but limited to class, teacher, and blackboard. Additionally, it has been established that teachers who are at the center stage of teaching and learning process need a high level of training in their various areas of specialization to enable them become abreast and acquainted with concepts, terms and issues related in their area.

Suggestion

There should be calls for an aggressive teacher training courses and capacity building programmes in ICT that will continue to keep teachers in tune with novel and basic issues of contemporary time since they are vested with the obligation of imparting same knowledge and skills to students for sound education.

References

Adenike, A. O. (2012). Functioned Teacher Education in Colleges of Technology: A catalyst for improving professionalism in Building Industry. *South–West Journal of Teacher Education*, 4: 549–560.

Ajeyalemi, D. (2005). *Challenges of teacher education for secondary schools in Nigeria*. A paper presented at a 2 -day National Workshop on the Counting Crisis of Secondary School Education in Nigeria: Confronting Old and New Challenges. Abuja, Nigeria. September 13 –14.

Akporehe, D. A. (2011). The Impact of Environment on Productivity in Secondary Schools. *African Journal of Education and Technology*, 1(1): 116-122.

Aladejana, F. (2012). Teacher Education: The functionality perspective in Nigeria. *South–West Journal of Teacher Education*, 4: 175–195.

Amedeker, M. K. (2005). Reforming Ghanaian teacher education towards preparing an effective pre-service teacher. *Journal of Education for Teaching*, *31*(2): 99-110.

Creemers, B. P. (1994). *The Effective Classroom*. London: Caseell.

Faizi, W., Shakil, A., & Sidra-tul-Muntaha (2013). The Effects of Using Educational Technology in Private Secondary Schools of Karachi, Pakistan. *International Journal of Academic Research in Business and Social Sciences*, 3(4): 163-171.

Federal Republic of Nigeria (2013). *National policy on education* (6th ed). Nigerian Educational Research and Development Council Publishers, Yaba, Lagos-Nigeria.

Hornby, A. S. (2010). Oxford Advanced learners' dictionary of current English, 8th ed; Oxford University Press.

Larose, F., David, R., Dirand, I., Karsenti, T., Grenon, V., Lafrane, S., & Cantin, J. (1999). Information and communication technologies in University teaching and in teacher education: Journey in a major quebec University reality. http://www.sociology.org/content/vol004.003/francois.html (Retrieved 24th July, 2018).

Lawal, H. S. (2003). Teacher Education and the Professional Growth of the 21st Century Nigeria Teacher. *The African Symposium*, 3(2): 21-36.

Masters J., & Yelland, N. (2002). Teacher Scaffolding: an exploration of exemplary practice. Networking the learning. Computers in education. Seventh IFIP World conference on computers I Education WCCE 2001. Kluwer academic publishers. Boston/ Doedrecht / London 289-300.

Nwachukwu, P. O. (2006). Appraising the relationship between ICT usage and integration and the standard of teacher education programmes in developing economy. *International Journal of Education and Devlopment using ICT*, 2(3): 22-31.

Narimantas, P., Vida, E., Juozas, M., & Edmundas, T. (2003). Information technology development in Lithuania: New tendencies and perspectives. *Journal of Business Economics and Management*, 4(2): 97-104.

Newhouse, C. P. (2002). A Framework to Articulate the Impact of ICT on Learning in Schools. Perth: Special Educational Service.

Osunde, A. U. & Omoruyi, F. E. O. (2004). An Evaluation of the National Teachers Institute's Manpower Training Program for Teaching Personnel in Mid-western Nigeria. *International Education Journal*, (5)3: 57-68.

Onasanya, S. A., Shehu, R. A., Oduwaiye, R. O, & Shehu, L. A. (2010). Higher institutions lecturer' attitude towards integration of ICT into teaching and research in Nigeria. *Research Journal of Information Technology*, 2:1-10.

Richey, R. C. (2008). Reflections on the 2008 AECT Definitions of the Field. *Tech-Trends*, 52(1): 24-25.

UNESCO (2003). Manual for pilot testing the use of indicators to assess impact of ICT use in education. http://www.unescobkk.org/education/ict/resource (Retrieved 24th July 2018).

Sinko, M. (2002). Factors Influencing Implementation of ICT in Higher Education. Networking the learning. Computers in education. Seventh IFIP World conference on computers I Education WCCE 2001. Kluwer academic publishers. Boston/ Doedrecht / London. 887-894.

Timothy, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australasian Journal of Educational Technology*, 24(4): 413-424.