



### Keywords

ICT,  
ICT Integration,  
Pedagogical Practices

Received: June 27, 2014

Revised: July 09, 2014

Accepted: July 10, 2014

# Towards the effective integration of ICT in educational practices; a review of the situation in Nigeria

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### Citation

Sani Alhaji Garba. Towards the Effective Integration of ICT in Educational Practices; a Review of the Situation in Nigeria. *American Journal of Science and Technology*. Vol. 1, No. 3, 2014, pp. 116-121.

### Abstract

This study examines the development and acquisition of functional skills for ICT integration within the context of teacher education in Nigeria providing an overview of ICT integration in educational practices in Nigerian teacher training institutions alongside policy issues. It examines issues and problems surrounding the current practices of ICT integration and identifies critical research gaps that need consideration. Qualitative research approach was employed. Data were collected from three sources and eight teacher educators participated in the study. Content and thematic analysis was used. Based on the issues that emerged from the analysis, the study consider the current practices in Nigerian teacher training institutions as not yielding the desired result due to technical issues relating to curriculum arrangement, pedagogical practices and infrastructure. Intensive research to address the issues identified in the paper is seriously recommended.

## 1. Introduction

During the last three decades, the world has witnessed remarkable development in information and communication technology (ICT). Particularly, advancement in computer and internet technology with its effects widely felt in all aspect of the society (Umar & Maswan, 2007). This development has in the recent times revolutionized the information industry; making information management, access and dissemination processes much easier, faster and efficient by means of digital electronic technology. With this technology, time and distance has become no longer a barrier to communication, interaction and economic transactions between people, institutions and nations across the world.

The rapid shift toward the use of this technology has largely been responsible for the emergence of e-transactions between people and institutions in all aspects of human life; making the world a global village and technology driven. This has led to an ever increasing human interaction with the computer, internet and other ICT facilities (Teo, 2008). This trend of development has made the need for ICT literacy and competence a necessity in the emerging technology driven world (Herselman & Hay, 2003). Thus, suggesting an association or correlation between individuals' personal success and occupational proficiency with ICT literacy and competence in any technology driven society (Teo, 2008).

The integration of this technology in socio-economic and political sectors of the society has made ICT literacy (and other forms of 21<sup>st</sup> century skills) part of the

current labour requirement (UNESCO Bangkok, 2003). With this development, the education industry needs to redirect educational practices towards assisting learners to become ICT literate and to acquire 21<sup>st</sup> century skills; thus, presenting a new challenge that adds to the role of the education industry. For school teachers to cope with the emerging role of helping the learner to acquire the 21<sup>st</sup> century skills needed; the teachers themselves needs to be ICT literate as well as competent and must learn to integrate their knowledge of technology and pedagogical skills in teaching their subject-subject content for 21<sup>st</sup> century skills.

The implication of this development provides the rationale and a strong base for establishing the necessity of ICT integration in educational practices and pedagogy ‘should the education industry strive to meet up with its responsibility of equipping the learner with what it takes to fit into the larger society—the 21<sup>st</sup> century skills’ (Okam, 2002). However, the success of ICT integration in any educational system is to a large extent dependent on its teachers for there is no education system that can rise above the quality of its teachers (NPE, 2004). For school teachers to effectively integrate ICT in their pedagogical practices, the pre-service teacher training program must be grounded to adequately prepare the teachers while on training for this emerging challenge.

The teacher is therefore a crucial factor in any educational system whose competence and efficiency has far reaching implications in the attainment of educational objectives and goals (Pelgrum, 2001). Thus, the level of ICT literacy and competence of the teacher is crucial in determining the success of ICT integration in schools (Rosnaini & Mohd. Arif, 2010). However, teachers’ competence toward the use and application of ICT in their educational practices is dependent on teacher education and training on one hand; and, teacher educators on the other hand. Workshops and stand-alone courses on technology integration for in-service teachers may not be enough in ensuring effective use of technology in pedagogical practices (Mishra & Koehler, 2006).

However, ensuring effective technology integration in teacher education would require a careful planning and transformational changes in curriculum content and pedagogical practices (Hammond & Munfra, 2009) in addition to having access to ICT facilities. Even though technology integration in educational practices is much appreciated and considered a welcome development by most teacher educations (Baron & Goldman, 1994; Ong, 1999); it is yet to be fully integrated in teacher education curriculum and pedagogical practices in Nigeria (Onasanya, et. al., 2010). Most often, lack of a theoretical and conceptual framework for technology integration in education and pedagogy has always been advanced as a reason for the low level of technology integration in teacher education and pedagogy (Misrah & Koehler, 2006).

## 2.1. Policy Development on ICT Integration in the Nigeria’s Education Sector

Considering the influence of information technology in all sectors of the society (Onasanya et al. 2010); the government in 2004 following this development came up with the policy for ICT integration in the nation’s educational system at all levels of learning. This consideration was in recognition of:

- a. the prominent role of education as a ‘viable instrument’ for the attainment of national development (NPE, 1998);
- b. the training and development of Nigerian youths into becoming responsible citizens, capable of contributing meaningfully to the socio-economic, political and the overall wellbeing of the society as adults (Okam, 2002);
- c. The training and development of required manpower as desired by the society to man all sectors of the economy.

The government consideration for ICT integration in Nigerian educational practices is to empower and strengthen the competence of the education industry towards meeting up with these responsibilities (Yusuf, 2005). Particularly, that of producing ICT literate citizens that can effectively fit into the contemporary information age where information technology has become an integral part of the society (Nwachukwu, 2006).

In pursuit of this consideration Federal Ministry of Education in conjunction with the National Educational Resource Centre (NERC *hereafter*) working on government directives introduces ‘computer science’ as a core and compulsory subject in Nigerian primary and junior secondary schools. Computer labs were built and equipped in most of the federal schools across the nation through the Education Tax Fund (ETF *hereafter*) intervention program. Candidates with Nigeria Certificate in Education (NCE *hereafter*) and specialization in computer science were recruited to teach the subject in primary schools while university graduate with B Ed; B Sc. Ed and B Sc. (computer science) were recruited to teach the subject in junior secondary schools.

In Polytechnics, Colleges of Education and Nigerian Universities, ‘introduction to basic computer knowledge’ was introduced as a compulsory course unit for all students under general studies department. The course is meant to exposed students towards acquiring basic knowledge, skills and application of word processing; excel; access; and database management. Computer assisted instruction was introduced as a compulsory course unit in educational technology for all pre-service teachers in Nigerian Colleges of Education. Certificate in computer appreciation and application is made a compulsory requirement of promotion in addition to publication for all serving academic staff in Polytechnics, Colleges of Education and Universities; and a compulsory requirement for all

candidates seeking employment as academics in all institutions of higher learning. From the 1990's, series of ICT standalone courses and workshops were organized and sponsored by federal and states government for teachers consistently.

Following these development, the government in 2004 come up with a revised edition of the National Policy on Education, incorporating the integration of ICT in education as part of the policy. The policy statement makes computer science a compulsory subject for all students in primary and junior secondary schools; making it a duty for the state governments and the private sector to make provisions for computer labs and equipment in all private as well as state owned schools as part of the accreditation requirement. The policy recognizes the teaching of computer science as a necessary step towards ensuring that:

1. Pupils at the end of their three years of junior secondary education are competent in the use and application of ICT for personal and industrial use;
2. Students at the end of their studies acquire the needed information and ICT literacy skills as a solid foundation for the use of information technology in higher education.

The policy charges the department of secondary education (Federal Ministry of Education) and the National Commission for Primary Education with the responsibility of providing in-service training for school teachers. Such training is to be directed towards preparing teachers to integrate ICT in their pedagogical practices.

The policy makes it compulsory for academic staff in all institutions of higher learning to integrate ICT in their pedagogical practices. Emphasis is particularly made on the integration of ICT in teacher education program. The emphasis was to ensure that, pre-service teachers trained in Nigerian Universities and Colleges of Education acquire the contemporary skills and competence needed for teaching with technology in the present information age. Consequent of this policy, desk-top computers for office use and laptops were provided to academic staff in Federal Universities, Colleges of Education and Polytechnics in batches. Additional computer labs, cable and wireless internet services as well as e-libraries were provided for students use by the respective management of the institutions, ETF and Petroleum Technology Development Endowment Fund (PTDF *hereafter*). Directives were given to private and state institutions to follow suite as requirement for accreditation. However, even with these resources and efforts, level of technology integration in Nigerian educational system at all levels is still very low (Abba Iya, 2012).

### 3. Methodology

Qualitative approach was employed for this study. Data for the study were collected from existing studies in literature and policy documents; observation and interview. The observation rubrics and interview protocol developed

and employed for the study were validated and tested in a pilot study conducted earlier. Eight teacher educators from four (4) colleges of education were purposefully selected and interviewed for the study. Both content and thematic analysis techniques were used in analyzing the data collected. The data collected from the three sources were sorted, coded and triangulated. Three (3) major concerns were identified as the emerging themes for the study.

### 4. Findings

Analysis of the data collected indicated the following as emerging themes:

1. Most of the educational practitioners in Nigeria at all level of learning lacks the necessary skills and competence needed for the use of ICT in their practices;
2. The interest of teachers and teacher-educators towards the use of ICT facilities provided is still below expectation;
3. The pedagogical practices and curriculum design of teacher training in Nigeria is yet to be directed toward the production of ICT literate teachers capable of integrating ICT in their professional practices.

### 5. Discussion

Despite the facilities provided, school teachers are unable to integrate ICT in their educational practices and pedagogy (Adeyemi & Olaye 2010; Yusuf, 2005). Though, series of workshops on ICT in education were organized for teachers; yet, apart from the computer science teachers, most of the teachers lack the proficiency and competence needed for ICT integration in education (Magawata, Muammad & Ahmad, 2011; Mezieobi, 2008). Because of their incompetence, most of the teachers developed negative attitudes with little or no interest in the use of ICT (BECTA, 2004; Hara, 1999). The situation is more particular in rural schools owned by the state governments where access to some ICT facilities is limited with over 65% of the teachers having no interest in the use computer associated technology in their teaching and learning (Adeyemi & Olaye, 2010). In this condition, actualizing the goal of producing school leavers capable of utilizing ICT in their higher education is likely to remain a mirage (Onasanya et al. 2010; Yusuf, 2005).

This situation is raising a serious concern over the credibility and competence of Nigerian schools towards actualizing Nigerian philosophy of education; directed towards producing citizens with competent ICT skills that can function effectively in technology driven society of the information age (Adeyemi & Olaye, 2010).The inability of the school teachers to use ICT in their pedagogical practices is associated with the poor state of technology integration in teacher education program (Yusuf, 2005).

Colleges of Education and other institutions of higher

learning in Nigeria are yet to fully integrate ICT in their teacher education program (Mezieobe, 2008). Even though, the impact of ICT integration on students' achievement is highly appreciated by most educators (Umar & Maswan, 2007), teacher educators hardly model the use of ICT in their pedagogical practices (Borlick et al. 2003). Classroom instructions in these institutions are still characterized with the use of conventional white boards and markers using the lecture oriented pedagogy. Hardly would the pre-service teachers see the teacher educators modelling the use of ICT tools in their classroom instructions. Even the lecturers handling the compulsory 100 level ICT course and 'computer assisted instructions' as a course unit in Colleges of Education teaches the course using the conventional lecture approach more literally than practical without using technology (Mezieobe, 2008; Nnabuo & Obasi, 2004). With such pedagogical practices, translating the vision and mission of producing teachers with high level competence and proficiency towards the use of ICT in their teaching into reality as envisage in the National Policy may likely remain a mirage (Yusuf, 2005).

The success of the much needed ICT integration in schools depend largely on the teacher's level of ICT literacy (Borlick, et. al., 2003; Paraskeva, Bouta, & Papagianna, 2008), competence, self-efficacy (Brown & Warschauer, 2006; Pelgrum, 2001) and interest (Ely, 1995). Acquiring this competence by teachers on training depends on the quality and effectiveness of ICT integration in teacher education program (Yusuf, 2005). To ensure this competence, there is the need for effective ICT integration in teacher education curriculum and pedagogical practices (Lim, et. al., 2010; Teo, 2008; Yusuf, 2005). This is lacking in Nigerian teacher training institutions (Yusuf, 2005).

## 6. The Research Issues for Further Studies

Based on findings from existing studies and literature, the problems identified above are considered as research gaps relating to skills acquisition for ICT integration in educational practices through teacher education. The identified gaps provide a justification for the research issues and questions listed below to be investigated into. The results and findings of such research investigations would provide the needed data that can be useful in re-planning and re-shaping the teacher training industry towards producing the desired teachers needed in the information age:

1. Why do teacher-educators hardly model the use of ICT in their pedagogical practices?
2. Are teacher training institutions in Nigeria well equipped in terms of infrastructure and facilities needed for the development of pre-service teachers' ICT literacy and competence?
3. Though, the need for ICT integration in educational practices is well appreciated as captured in the

4. National Policy on Education; yet, not much of it is seen in practice in our institutions of learning. Why? Has the current curriculum arrangement and pedagogical practices in Nigerian teacher training institutions have any significant impact on pre-service teachers' ICT literacy and competence?
5. ICT in education within the context of Nigerian teacher education need to be considered as an emerging 'domain' that requires new forms and techniques of measurement, evaluation and assessment. Researches are therefore needed in this area to produce the desired instruments and evaluation techniques for measuring achievement in this domain.
6. Why are school teachers unable to integrate ICT in their practices?
7. Are school teachers in Nigeria lacking the proficiency and competence for ICT integration in educational practices? Why?
8. Why do teachers' in Nigerian schools develop negative attitude towards the use of ICT in their practices?
9. Are there issues relating to teacher motivation and interest towards the use of ICT in their educational practices?

## 7. Conclusion/Recommendations

Based on existing studies as established in literature, it is evident that despite the huge amount of money spent by government and other stakeholders of the education industry in Nigeria for ICT integration in education; not much of a success is recorded. We are yet to witness any significant shift from the use of traditional pedagogical practices to that of the 21<sup>st</sup> Century approach. For the education industry in Nigeria to catch up with the current trend in educational practices, the teacher training institutions must be competent enough in producing teachers with high level of ICT literacy skills and competence as well as such proficiency as may be required for effective integration of ICT in educational practices. The provision of ICT facilities, ICT workshops and stand-alone courses as currently practiced may not be enough for the desired result. Thus, restructuring the curriculum arrangement and pedagogical practices of the teacher institutions based on research findings is recommended. It is believed that, if the research issues identified above are investigated through intensive educational research processes; the findings of such studies would go a long way in providing the scientific bases needed for effective restructuring of the system. Findings of such studies may likely produce new theoretical and conceptual frameworks, new instructional designs and models likely to produce better result for ICT integration in our educational system.

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