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Need for ICT Integration for Effective Instructional Delivery in Nigerian Colleges of Education

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Abstract
Teaching and learning is the principal stock in trade of any educational enterprise throughout human history whether in the developed, developing or under-developed countries. The various developments in the field of information and communications technology (ICT) have been found very useful in the learning environment globally. The need to fully integrate ICT in instruction at the Colleges of Education level has become necessary in view of the demand on graduates of the college of education system to be ICT literate in an emerging world that is ICT driven. The products of the system are not for the Nigerian educational industry alone but for a collaborative and competitive global village where knowledge is created and shared using ICT. This paper discusses the need to achieve effective instructional delivery in colleges of education through the use of ICT. It examines the concepts of effective instructional delivery, ICT and ways of integrating ICT in teaching. The major constraints to the integration of ICT in the class room are highlighted and recommendations that will help in its' effective integration in teaching and learning at this level made.
Keywords: *Effective instructional delivery; Colleges of Education; ICT integration; Nigeria.*

1. Introduction

Educational institutions the world over have recognized the important roles technology plays in the learning environment hence the amount of money spent and importance attached to its acquisition. This has made the business of education in the developed world highly hinged on digital technology to the effect that any teacher who is not digitally literate may not have a place in the electronically driven classroom. Literacy is now synonymous with acquisition of computer literacy, skills and competencies.

The Federal Republic of Nigeria is not oblivious of this modern trend and seriously recognizes the role of ICT in the advancement of knowledge at the tertiary level of education (FRN, 2004). The launching in 2004 through the Federal Ministry of Education of the ministerial initiative making e-education one of the initiatives for the attainment of Education for All (EFA) and the Millennium Development Goal (MDG) was a practical demonstration of this fact. ICTs were meant to be used as the mode for instructional delivery. The characteristics and benefits of ICT in higher education according to Simuyi (1999) cited in Adegbija (2011, p560) can be summarized as follows:

- Increase access to instructional resources through the Internet,
- Share experiences through technologies such as the virtual university,
- Increase access to higher education through distance teaching and learning,
- Increase flexibility in what to learn, how to learn it, and where to learn it, and
- Motivate potential learners to engage in higher education.

In an organized learning environment, where the sole intent is to improve learning, all these benefits are easily realizable with the adequate provision of needed ICTs, availability of technical support staff and the provision of requisite infrastructure such as uninterrupted electricity.

Colleges of Education are teacher education institutions for the training of middle level manpower. The Colleges admit and train candidates for three years after Senor Secondary School education for the award of the Nigeria Certificate in Education (NCE). Graduates of the Colleges of Education can teach at the pre-primary, primary and junior secondary school levels of Nigerian educational system (Ibidapo-Obe, 2007; Ololube, 2006). Though Colleges of Education in Nigeria have established ICT centres to cater for the information and communication technology needs of the staff and students in the academic environment, the job of integration of ICT in ensuring effective instructional delivery at that level has gone beyond setting up of such centres.

The information and communication technology need of a college of education in this knowledge era goes beyond the assemblage of computers in a room called computer or ICT laboratory without internet connectivity and regular and uninterrupted supply of electricity. Even where the computers are connected to the Internet, it does not have the magic wand to transform the learning environment without a teacher with the technological, pedagogical and content knowledge (TPACK) to use them in the classroom situation (Mishra & Koehler, 2006). The college of education system being the level that trains the teachers for the Nigerian basic education level should be adequately equipped with ICT resources which the teacher educators in these colleges need to use in the training of future teachers. There is no gainsaying that a teacher trained using ICT resources

will definitely use same in his teaching after training unlike a teacher trained without them.

2. Information and Communication Technology (ICT)

Generally, the term Information and communication technology (ICT) refers to any arrangement that is capable of capturing, storing, retrieving, manipulating, transmitting or receiving of information or data. In a broad sense they include; television sets, bulletin boards, radio, record players, disc players, still camera, video camera projectors, computers, interactive white board, internet and the internet resources etc. Mejiuni and Obilade (2006) defined ICT as the electronic and non-electronic technologies and infrastructure systems used to create, store, manipulate, retrieve, and communicate or disseminate information. Information and communications technologies are computer based tools used by people to work with information and communication processing needs of an organization. Its purview covers computer hardware and software, the network, and other digital devices like video, audio, camera, and so on, which convert information (text, sound, motion, etc.) into digital form (Moursund & Bielefeldt, 1999).

As a general term, information technology encompasses all forms of technology to create, manipulate, store, communicate and disseminate information in its various forms through the network of computers and other emerging technological devices. For the purpose of this study the definition of information technology provided by the Moursand & Bielefeldt (1999, p. 5) was adopted. According to them, information technology includes computer hardware and software, the network that ties computers together and a host of devices that covert information (text, images, sounds, motion) into common digital formats.

ICT is defined as computer based tools used by people to work with the information and communication processing needs of an organization. It encompasses the computer hardware and software, the network and several other devices (video, audio, photography camera, etc.) that convert information (text), images, sound and motion and so on into common digital form (Milken Exchange on Education Technology, 1999).

3. Effective Instructional Delivery

Teaching and learning being two faces of the same coin presupposes that teaching leads to learning. Many methods and strategies have been variously used in the learning situation to achieve the desired objectives of classroom instruction. Mostly used is the Colleges of Education in Nigeria is the traditional mode of delivery which is the face to face mode. This mode of delivery has been variously viewed as not being able to meet the challenges of learning in a technology driven age. The student in this learning situation is passive (Anderson, 2013; Thiagarajan, 2005) as it is the job of the teacher to present the content. In this learning setting, what is promoted is shallow learning in the sense that assessment is usually based on memorization and regurgitation of facts.

The coming of ICT into instruction is supposed to mark a paradigm shift signalling the end of the teacher being perceived as the sole repository of knowledge especially with the availability of numerous amount of information on the Internet and the worldwide web. Gone should be the days of "hypodermic needle" method of teaching when teachers and academic practitioners saw themselves as knowledge oracles and sage of the stage delivering data, information and knowledge to eager learners whose minds are empty vessels that needed to be filled (Ajayi, 2001). However a close observation of the manner in which lecturers carry out their instructional delivery in the colleges today shows that we are far from achieving effective teaching and learning using ICT. The coming of ICT into teaching and learning have necessitated a paradigm shift from the traditional method that was teacher centred to the modern method which is learner centred (Trucano, 2005). The gains of such a new approach have been extolled by Buabeng-Andoh (2012) who affirms the great capabilities of ICT in the spreading of knowledge, making education more real and the development of more efficient educational service.

Abolade and Yusuf (2005) posit that information and communication technologies are essential tools in any educational system with the possibilities of being used to meet the learning needs of individual learners, support equality of educational opportunities; offer high quality learning materials, increase self-efficacy and independence of learning among students, and enhance teachers' professional development. The integration of ICT in the classroom creates a more inclusive learning platform which kindles interaction there by removing passivity (Ibeh, Adamu and Owoseni, 2007). Similarly, Olorundare (2006) asserts that ICT is important in teaching and learning as it guarantees unrestricted access of teachers to relevant information and development in subject area as well as the provision of efficient and effective tools to take care of students' individual differences.

Effective instructional delivery embraces all human interactive skills employed by the teacher to promote/facilitate learning in the classroom situation thereby leading to improved performance on the part of the learner. It is a process in which teachers apply repertoire of instructional strategies to communicate and interact with the learners around academic content, and to support student engagement for better learning outcome. Many institutions have adopted ICT and so much money has been invested in computerizing these institutions however

some scholars have argued that there is no positive impact of these huge investments in making learning effective(Stool, 1999). This can be explained by the fact that the teachers who are meant to use such technologies have no initial training on how to use same in teaching (Ojo, 2005; Jegede, 2009). It turns out to be a challenging situation for these teachers to attain adequate mastery of skills and contents that are inherent in ICT. There is therefore the necessity to add in the teacher education program as a necessary component of the course, provision of instructional models for classroom application of ICT (Diem, 1989; Haywood, and Norman, 1988; Novak and Knowles, 1991).

Teacher educators are models whether in the faculties of education in universities or colleges of education. In playing this role, Yalcin, Yalcin, Sagirli, Yalcin and Koc (2011) posit that it is imperative to use appropriate pedagogy when utilizing technology in a classroom of pre-service teachers. They maintain that it is not enough for lecturers to use technology to learn; in addition they must learn how to use them effectively in their lessons and classroom. The TPACK model readily becomes relevant in this regard as lack of technological pedagogical content knowledge has been the missing link in our teacher education programs. Thus a lecturer using internet search to find materials for research, teaching materials and word processing his lecture notes though he is using ICT, has not fully integrated it into learning. His ICT usage has not impacted on the students' learning since the students have no contact and usage of the ICT in their learning.

4. Need for ICT Schools

There is widespread belief that ICT can and do empower teachers and learners, changing teaching and learning processes from being highly teacher-dominated to student-centred. The result of this transformation will automatically be increased learning gains for learners, creating and allowing for opportunities for the development of their creativity, problem-solving abilities, informational reasoning skills, communication skills, and other higher-order thinking skills (Trucano, 2005). In the 21st century, there are basic skills and competencies which an individual is expected to possess for optimal functioning and survival in the digital age. These skills are centred on the effective utilization of ICT in learning and performing other daily routine activities, thus making room for lifelong learning. This being the case, no effort should be spared in making sure that Nigerian classrooms are ICT driven through its integration in instruction.

Two things are involved when we talk about integration of ICTs in effective instructional delivery in other to prepare the pre-service teacher to use technology in teaching. The first is general computer literacy (operating system, word processing, spreadsheet, and database) and telecommunication. The second is professional literacy- a basic understanding of how computer and related technology can be used in education, as well as specific novice skills for integrating technology into the curriculum at the grade level and in subject pre-service teachers plans to teach (Willis, 2001). A combination of computer literacy and professional literacy in a conducive-learning environment will invariably enhance the performance of the learner. Attainment of enhanced learning is highly dependent on the will and competencies of the teacher in performing his duties.

Given the role education plays in the development of any nation, Kwache (2007) notes the indispensability of the school in the growth of an ICT learning culture of any country. He maintains that the school should offer efficient leadership in ICT integration through research, modelling of effective integration of ICT and provision of opportunities for professional development of citizens of a country. The teacher education institutions such as the colleges of education as we have them in Nigeria should play a leading role in this regard.

4.1 State of ICT Integration in Colleges of Education

Despite the fact that the Federal government of Nigeria recognizes the need for ICT in education in her various policies (FRN, 2001; FRN, 2004)) the state of infrastructure on ground is not commensurate to the media attention generated. The availability, adequacy and accessibility of these resources have been issues of research. There seem to be a dearth of research information as to the actual impact of ICTs in instructional delivery in the Nigerian Higher institutions especially at the College of Education sector. Ajayi (2008) reported lack of ICTs in colleges of education in South-Western Nigeria and as such ICT were not adequately used in teaching and learning.

In a study carried out by Jude and Dankaro (2012) at the College of Education Katsina-Ala, Benue State of Nigeria, it was also discovered that ICT resources were not available in the institution. Since accessibility and utilization of any resource is dependent on availability, they concluded that ICT has not been used effectively in instruction. In a study tagged "Pattern of computer and Internet use among teachers in higher institutions in Nigeria", Awoleye, Siyambola, Egbetokun, Yesufu and Adewoyin (2008) found out among other things that the only college of education involved in the study ranked least on computer and internet use out of the seven higher institutions from South-west Nigeria that participated in the study.

The actual integration of these resources in teaching and learning is yet another. This is because available ICT resources can be used by both lecturers and students for other purposes other than in the classroom situation. Ajayi (2008) studied effective use of information and communication technology in teaching in

colleges of education in western Nigeria and reports only 23% ICT usage in teaching. The study further revealed that what was actually available and used in teaching were the standard technologies. The digital technologies which are presently the crux of ICT integration in education were not available. It is rather sad to note that some educational administrators at the college of education level in Nigeria tend to perceive ICTs as tools to pass NCCE accreditation rather than a necessary tool for effective teaching and learning.

The fact that faculty members in these Colleges of Education were trained without ICT is a pointer to the fact that they do not use them in teaching. In other words, the capability and readiness of any teacher educator to infuse ICTs into his/her teaching will largely be determined by the professional training and development which such a lecturer receive (Pearson, 2003; Watson, 2001; Williams, 2003; Selinger & Austin, 2003). There is serious doubt if the faculty members in these Colleges possess the requisite skills and competencies to cope with ICT usage on individual basis before introducing same in the instructional setting. The right step to effective use of ICT in the classroom will be ICT literacy before professional competence. This is against the backdrop that most of them were trained without the use of ICT hence it is usually difficult for one to give what he does not have.

It is not also certain that management of these Colleges of Education do organize regular in-service trainings for these lecturers who initially did not possess ICT literacy on employment to develop the skills and competencies needed for teaching with ICT. The so called capacity building workshops occasionally organized for teacher educators most often lack proper planning and adequate follow up activities to make the learned materials practicable and useful to both the teacher educator and the teacher education institution. Most of these programs apparently are mere jamborees aimed at certificating teacher educators already in the system. This is perceived so because ICT literacy has been made a prerequisite for their continued stay in service by Nigeria Commission for Colleges of Education (NCCE), the teacher education regulating body (Owolabi, Oyewole & Oke, 2013). A visit to the classrooms in almost all the colleges of education in the country may reveal that ICT is not yet a common feature of the classroom environment despite the claim that all teacher educators are now ICT literate by virtue of the fact that they attended these workshops. Even when the workshops are well organized, the working environment in these colleges with its attendant lack of adequate infrastructure drastically reduces the gains of the programmes.

4.2 Constraints to the Integration of ICT in Teaching and Learning

Despite the important role and obvious need for the integration of ICTs in teaching and learning, many factors constitute constraints to its use at the college of education level in Nigeria. Such factors include epileptic supply of electricity throughout the country, limited and inadequate ICT facilities (Abolade & Yusuf, 2005; Ajayi, 2008; Issa et al. 2011; Oye et al. 2011, Onwuagboke, Singh & Onwuagboke, 2014). Other factors include lack of technically experienced lecturers, inadequate course content and Lack of access to ICTs in trainee teachers' field experience (Abolade & Yusuf, 2005).

Other factors identified by Ajayi (2008) are lack of support for the integration of ICT in teaching, lack of internet out lets in the classrooms (Onwuagboke, Singh & Onwuagboke, 2014) and expensive nature of ICT resources (Issa, et al. 2011; Oye et al. 2011). With the Nigerian Communication Commission supply of laptops to lecturers in the colleges of education, the stage was set for integration of ICT by the lecturers in their teaching. However the lack of internet connectivity in the colleges especially in the classrooms (Arikpo, et al 2009), poor supply of electricity as well as lack of the technological pedagogical content knowledge TPACK required for teaching with technologies invariably rubs these colleges of the benefits of ICT enriched learning.

4.3 The Way Forward

For effective instructional delivery at all levels of Nigerian educational system, the groundwork should be done at teacher training institutions. Teaching of methods course in the colleges should be integrated with the ICT course so as to enable the teacher trainee to acquire the ICT skills of teaching alongside the methods of teaching through modelled examples by teacher educators. This integrated approach has been empirically found to yield better students' achievement (Garba, Singh and Yusuf, 2013) than the stand alone ICT courses as prevalent in the Colleges of education in the country.

The Federal Government of Nigeria should wake up from slumber and vigorously pursue the faithful implementation of her policies as it concerns ICT in education. More especially as stated in Section 11 sub-section 102 (d) of the National Policy on Education that "Government shall provide facilities and necessary infrastructure for the promotion of Information and Communication Technology at all levels of education" (FRN, 2004:53).

A review of the 2001 IT policy should be carried out after assessing the success or failure observed in implementing the policy through research so as to ascertain what is lacking in its implementation after more than a decade of its operation. This is so recommended in view of the findings by Adesina et al. (2014) that teachers' awareness of the existence of ICT policies and initiatives is lacking. This assessment will no doubt strengthen

the policy as well as make room for more focus on its implementation.

In the appointment of leadership personnel of Colleges, government should make it a point of duty to include proficiency in the use and exemplary attitude towards ICT as criteria for such leadership positions. As it is usually impossible for one to give out what he does not have, appointing leaders who lack competence and interest in ICT will further deteriorate situation. This will help to empower people who are enthusiastic about ICT to strive to reposition the Colleges for the attainment of the benefits of ICT in our colleges and eventually translate same to our schools.

5. Conclusion

In conclusion, the role of ICT in the 21st century classroom has been variously stressed. The colleges of education system being the sector that is responsible for training teachers for Nigeria's basic education should be responsive to the demands of teacher training in this milieu. The benefits accruable to the education industry if ICT is effectively integrated in instruction at all levels are enormous and yet to be realized. Seamless integration of ICT in instructional delivery has the potential of facilitating instruction while at the same time enhancing learning amidst other benefits. The potentials of ICT can be harnessed for the benefit of Nigerian educational system if recommendations made in this paper are given a trial among other initiatives as this is not exhaustive but basis for further initiatives towards achieving effective instructional delivery in Nigerian Colleges of Education.

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