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Incorporating Information, Communication Technology (ICT) Into Teaching and Learning in Secondary School to Meet the Needs of Modern Nigeria Society

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Abstract

This paper focused on Incorporating Information Communication Technology(ICT) in Teaching and Learning in secondary school to meet the need of contemporary society, and also discussed various ways through which the educational managers and teachers can facilitate the incorporating of ICT in classroom, how it can benefit the students in their educational achievement. The paper noted some of the ICT tools used in teaching and learning such as laptops, phones, educational tablets, projectors, power-point, coral draw, google document. Furthermore, the paper identified the challenges militating against the integration of ICT in teaching and learning process and proffered solutions to the challenges bedeviling ICT integration. The paper therefore suggested that the government should provide adequate ICT facilities that will promote proficiency in teaching and learning. Also government should organize workshops, seminar and conferences that will train and retrain teachers and managers in the use of technology, this will aid them to meet up with global practices.

Keywords: Integration, ICT, Teaching and Learning, Contemporary Society

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INTRODUCTION

The role of information and communication technology (ICT) in teaching and learning is rapidly becoming of the most vital and widely discussed issues in the contemporary world especially in education (Thierer, 2002). Computer and other technological tools have fundamentally transformed all aspect of human lives, many education researchers and reformers have agreed that ICT can be of an important part of effort to personalized education (Christensen, 2008; Collins & Halverson 2009; Luckin, Baker & Tonken, 2010). Experts in the field of education are of the opinion that if properly used, ICT will greatly improve teaching and learning process, in

addition promote and enhance the acquisition of knowledge and skills and improves workforce opportunities.

UNESCO (2002) refers ICT as a scientific technological and engineering disciplines and management techniques used in handling information, its application and association with social, economic and cultural matter. Beckinsale and Ram, (2006) defines Information Communication and Technology as any technology used to support information gathering, processing, distribution and use.

Integration of Information and Communication Technology (ICT) in education refers to the use of computer and other technological gadget that are incorporated into daily classroom instructional process with the view of preparing student for the digital era. Currently, ICT facilitate not only the delivery of lessons but also the learning process, these includes computer base technology, digital imaging, the internet, file servers, data storage devices, desktop, laptops, projectors and broadcasting technologies namely radio and television, and telephone which are used as instructional tools at schools.

Teachers are seen as the key instructors in the use of ICT in classrooms, because teachers skilfully impact or transfer knowledge to the learners, also encourages the learners on skill development by evaluating, accessing and providing best teaching methods. ICT provides dynamic and proactive teaching and learning environment, and Hatlevit, (2012). ICT also equip students and learning communities to face the challenges of current globalization (Albirimi, 2006).

In the advance nations, there has been staggering amount of research and publication related to ICT for education purpose and it importance. This 21st century almost everyone in the industrialized nation have access to ICT and purchase of computer for education purpose. For example, in Britain, the story is the same as the wider availability of computer in school was made possible, through government funding.

Largely through the Local Education Authorities (Visseher, Wild, Smith & Newton, 2003) reported that following the education reform in act in 1988, the central government made available 5,325 million over time to promote the use of computer in school administration and management.

In Nigeria the need for government to integrate ICT into teaching and learning is mandatory because technology link schools around the world in order to improve education enhance cultural understanding and develop skills that teachers need for securing employment in the 21st century. The demand for ICT are characterized by numerous innovations especially in the area of scientific research, management and control of educational sectors, staff training and retraining of capacity building, and selection of suitable curriculum content, distribution and utilization of information and communication technology (ICT)-based instructional materials are important Ololube (2018), all these will gear towards teachers education meeting global demands.

Information Communication and Technology Resources

Word processing: has close links to literacy and language development. Being proficient in word processing skills is something which students will continually use and build on throughout

their school career. Blogs are an excellent way for students to collaborate and communicate using an online word processor.

Wikis ('What I Know Is'): These can be a repository of knowledge for students and like blogs, the possibilities for wikis are wide open. There can be research projects, writing projects, and library projects just to name a few.

Web creation and design: These are really online word processors and so the possibilities in literacy lessons are endless but can be limited to the teacher's own capabilities in ICT.

Web searching (Information literacy skills): The ability to find information is a vital skill to have in the 21st century. What strategies are available to navigate electronic texts and the internet? Where are the signposts and clues?

Drawing and graphics programs: Visual literacy is equally important today than ever before. Imagine demonstrating to your students how to use one of these drawing or graphics programs so that they can use it creatively in order to add an image to a newspaper article, to understand how pictures can sometimes tell a thousand words just by the colour, expressions or medium used

Digital video: Harness the power of video to help students develop their language skills.

Spreadsheets and Databases: Who said that these can't be used in English lessons? What about opportunities for the teaching and reinforcement of a range of higher-order language skills, such as keyword selection and the skimming and scanning of text?

Google Classroom: as the name suggests, is a virtual classroom that makes learning easy and fun. Teachers can integrate educational apps or websites and create interactive assignments. You can include a slideshow, a small game, or an entertaining YouTube video full of information. This way, kids learn better and enjoy their learning experience. Also, Google Classroom allows you to go paperless. You can easily create paperless assignments and grade students within a few minutes. This way, you can save time and focus more on improving the learning experience. Furthermore, you can create a separate drive folder for assignments, grade sheets, attendance sheets, etc. And you can access all this on the go, even from your mobile or laptop.
What's more, Google Classroom allows virtual meetings. You can host parent-teacher meeting sessions online from your home. It's beneficial both for you and the parents, especially during the lockdowns.

Trello: is a collaborative tool that is used widely in IT companies with large teams. Fortunately, it has several applications for you educators as well. If you prefer project-based learning for students, Trello is for you. Trello has these digital boards. You can create different boards for assignments, test papers, etc. And in those boards, you can create cards. Furthermore, you can

discuss a particular topic in that card. You can invite your students to view that card. And the students can put in comments, doubts, or ask questions and even attach images, videos, etc.

Microsoft Teams: is another popular tool for IT professionals. And similar to Trello, it has several applications for teachers and educators. Microsoft Teams is a Microsoft Office 365 product. It simply means you can host meetings, chat, share files, and use every Microsoft Office app using Teams.

One of the best features Teams comes with is the Class Notebooks from One Note. Class Notebooks resemble individual student notebooks (physical) but come with additional features and ease of use. Teachers can assign individual notebooks to students and provide them with real-time feedback. You can easily distribute exams, handouts, quizzes, and homework instantly to your students.

Also, the students can use amazing tools within Teams for taking notes and highlighting important things. This helps the students engage more and enjoy learning. All in all, Teams can reduce the manpower and can completely replace the use of paper. It's yet another amazing tool that ensures effective education online.

Online Coding Websites such as DataCamp, HackerRank, Coderbyte. No minimum age exists when it comes to learning how to code. If you want your students/kids to learn how to code, make sure it's practical. Practicing code on paper is simply a waste of time. And it also kills the creative talent of the students.

State of ICT Integration in Nigeria and the Nigerian Colleges of Education

Not much of digital technologies are used in pedagogical practices by teacher educators in Nigerian Colleges of Education and other institutions of higher learning. Most of the institutions do not have the necessary ICT facilities for instructions and research neither do teacher educators possess the needed skills and competence for effective integration of ICT in classroom instructions (Agbatogun 2006). Level of ICT literacy among academic staff and students in Nigerian Colleges of education is still very low (Ololube 2006). Most of the teachers in Nigeria at all levels do not have the needed experience and competence in the use of computers either for educational or industrial purposes; neither do they have the needed skills and knowledge in the use common computer software (Yusuf 2005; Onasanya et al., 2010). ICT education is more literary than it is practical in terms of physical use (Nnabuo & Obasi 2004). When teaching and learning is accessed critically in Nigerian Colleges of Education, it could be observed that the challenge for teacher educators is no longer in covering the course contents, but in having access to ICT and using it to enhance teaching and learning (Onasanya et 'et 2010). Is this state of affairs having any implication on social studies pre-service teacher training in Nigerian Colleges of Education?

Benefits of ICT in Teaching and Learning

In the changing world of global market competition, basic education is necessary for an individual to have capability to access and apply information based on various changing need of

the society. Various theories and policies on education had it that education had undergone some changes, so the teacher should get ready to cope with the technology and its application in teaching and learning. The benefits include the following:

Encourage Individual Learning: Enables self-paced learning where students are able to choose what they would like to focus on and spend variable amounts of time on it based on the perception of their learning needs and positions.
Instructional Aid: It presents instructional material more interesting and attractive, rather than the conventional method of teaching. Also it makes teaching and learning easier and effective.

Knowledge Retention: It promotes learning by doing approach, i.e. it provides higher retention potentials for user to develop their individual intellectual and creative ability.

Accessibility: ICT provides access to wide range of up-to-date learning materials, also helps in exploring useful information that will help in their academic work by learning through a combination of audio, video, images, text and animation.

Collaboration: Enhances learning through interaction and collaboration and provides a platform that engages students, teachers and the global world.

The Roles of Teachers/Managers in the Integration of ICT in Teaching and Learning
Teachers play a vital role in the integration of ICT into classrooms. Teachers are responsible for creating the environment in the class. Teacher's preparer the learning opportunity that helps the student use the lesson of communication technologies and serve as instruction in different field.
Since the technology based training is learner centered there has been a shift from traditional teacher as instructor, here student can facilitate the learning process with the help of technologies and instruction from teachers without tome and place constrain, in such an atmosphere they can easily collect, and analyze data, testing hypothesis, designing experiment and making conclusion. Because utilization of tools and technologies in classroom has a time constrain (limit) (Azumi, 2008).

Strategies for ICT Integration
The author proposes the following strategies for ICT integration in the Nigerian education system.

1. In planning for ICT integration in education policymakers in Nigeria would dowelltobeginbydeterminingtheeducationalpurposesthattechnologiesaretoservebeforethey are brought on board. This means clarifying overall education policy as this should serve as the rationale and road map for technology integration. It is important to note that technology is only a tool and as such it cannot compensate for weaknesses in education policy (Haddad, 2007).
2. Once national education goals have been clarified, policy makers need to decide on

what ICT integration approach to adopt. Farrell and Wachholz (2003) found three different strategies being used in Asia Pacific countries which can be beneficial to the Nigerian education system.

- teaching ICT as a subject in its own right, usually beginning at the upper secondary level, to develop a labour force with ICT skills;
- incorporating ICTs across the curriculum to improve teaching and learning; and
- using ICTs to foster learning anywhere and anytime as part of the development of a knowledge society in which all citizens are ICT savvy. Each of these has different infrastructural, personnel, and management requirements among others.

3. Private Sector-Public sector partnerships to either pilot or fast *track* ICT- based projects is a strategy that has gained currency among ministries of education in developing countries. These partnerships take many forms, including private sector grants with government counterpart contributions, donations of equipment by corporations to schools, and provision of technical support assistance for planning, management, and strengthening human resources at the grassroots level. However, the financial litmus test of ICT- based programs is survival after donor funds has run out. Many ICT–based education programs funded by aid agencies could not sustain because government failed to step in with then necessary funding. Thus, a two–fold strategy is imperative; government support and local community mobilization.
4. One of the greatest challenges in ICT use in education is balancing educational goals with economic realities. ICTs in education program require large capital investments; hence caution is required in making decisions about what models of ICT use will be introduced and the need to maintain economies of scale. Consequently, it is an issue of whether the value added ICT use offsets the cost relative to the cost of alternatives. In other words, is ICT–based learning the most effective strategy for achieving the desired goals, and if so what is the modality and scales of implementation that can be supported given existing financial, human and other resources. Tino (2003) suggests the following possible sources of funds and resources for ICT use programs: (1) grants, (2) public subsidies, (3) private donations and fund raising events, and (4) community support.
5. Teachers are critical to ICT-based learning and a good strategy for ICT integration in education should involve their professional development in five areas: (1) skills with particular application, (2) integration into existing curriculum, (3) curricular changes related to the use of IT(including changes in instructional design), (4) changes in teachers' role, and (5) underpinning educational theories (Tino, 2003). ICTs are rapidly evolving technologies and even the most proficient teacher need to continuously upgrade his or her skills in line with international best practices.

Challenges to Effective Integration of ICT in Education

SomeofthechallengestoeffectiveintegrationofICTintheNigerianeducationsystem include:

1. In Nigeria a good number of teachers and support staff in the school system are far

from being computer literate. As Akubuilo and Ndubuizu (2007) rightly notes a high percentage of teachers and lecturers in science subjects in Nigeria are computer illiterate. From this standpoint, it is obvious such teaching staff will find it extremely difficult to deliver ICT compliant education and training.

2. Low tele density constitutes a major challenge to ICT integration. For instance, access to telecommunication tools such as computer, Internet and telephones are still low. Adeyeye (2006) notes that Nigeria has the second largest telecommunication sector in Africa (second to South Africa) with a subscriber base of 20million, but has a tele density of less than15% while Canada with a much smaller population has tele density of l07%.
3. Power supply in Nigeria is epileptic. ICT facilities are power driven. In urban cities where there is power supply it is irregular and therefore interrupts the effective use of ICT facilities.
4. Low level funding has resulted in low level provision of ICT facilities in schools.

Gbadamosi (2006) observes that education is grossly underfunded in Nigeria and has affected many areas such as the funding of ICT project, training and retraining of teachers, and development of software packages. The current level of funding education in Nigeria with decreasing budgetary allocation to the education sector is a major constraint to provision of ICT facilities in schools. For instance, the federal budgetary allocation to education in Nigeria for years running are far below the 26% education sector funding benchmark stipulated by the United Nations Educational Scientific and Cultural Organization (UNESCO). The effect of poor funding is more pronounced in tertiary institutions where computers are needed for instruction and global information.

On a serious note, ICT has not been fully integrated into the curriculum of primary and secondary education in Nigeria. Not until the national policy on education is revised to fully integrate ICT in the curriculum the problem will still linger.

Teachers as Facilitators

The need for teachers involvement is necessary to avoid leaving the technology control the lesson. According to Brandle, (2002) opinions that ICT can be more effective if teacher's role a "facilitator" who plans, guide the lesson. Therefore, to use the modern technology effectively the teacher must be prepared to assume the new role as facilitator (Canado, 2010).

Teacher as Integrators

The role of teacher in the Integration of ICT must change in the sense that it is no longer sufficient for teachers to impact only knowledge, but rather teacher should encourage critical thinking, skills promote information literary and nurture, collators working practices to prepare learner for real life situations, like the use of ICT in making projects and presentation.

Teachers as Collaborators

The internet provides opportunities for inquiry-based learning where teacher and student are able to access some of the world largest information achieves the teacher and student are able to connect and collaborate with each other which will lighten the burden and make efforts more fruitful and rewarding.

Globally, today using ICT teachers and students can Skype or chat online as part of language learning process, they are motivated to communicate and collaborate with other peers to produce common products, for instance, wikis.

Teacher as Evaluators

The need for teacher to be acquainted with skills and knowledge of ICT will help them in evaluating the students' performance in the use of ICT and promise professionalization.

Factors Militating against ICT Integration

Nigeria enacted a policy on Computer Education in an attempt to keep pace with technological development. ICT integration into classroom and the innovation thereafter, first to all secondary school and later to primary school but the idea was not successful due to some constrain to the use of technology which include;

Teacher's Attitudes: For a successfully implementation of ICT into teaching and learning practices or programmes depends strongly on the ability of the teacher's support and attitude or belief towards technology (Keengwe & Onchwari, 2008) states that if teacher attitudes are positive towards the use of educational technology, then, they can easily provide useful insight about the adoption and integration of ICT into teaching and learning process.

ICT Competence/Lack of Skill: Computer competence is the major challenges facing integration of ICT in schools most of the teachers are not computer literates by so doing they lack computer skills and are not computer competent. Tondeur, Valcke and Van Braak (2011), defines computer competency as being able to handle a wide range of varying computer application for various purpose.

Accessibility/Poor Network: The effective integration of ICT into teaching and learning process depend on the accessibility of ICT resource such as software, hardware and electronic equipment such as television projectors and so on. The poor network system is a high problem to the use of ICT.

Poor Electricity Supply: The problem of poor electricity supply is a big setback to the integration of ICT in schools, because most public schools are in need of adequate power supply, because ICT gadgets are electronics and can only function with the aid of electric current.

Cost: The internet as we know today was created in the United States of America and introduced to the rest of the world. Americans still have a strong hold of control, as most developing countries pay huge amount of dollar for few megabits per annum (Tongia, 2004). High cost of internet or data, apparently affects the utilization and full integration of ICT into schools. Also, the price of ICT infrastructure is capital intensive in the developing world and this pose a big problem in the basic computers themselves, other cost associated with peripherals such spare disks drive, projectors and so on are beyond the reach of most schools.

Fear of Change: The fear by teachers to adapt to the new and modern method of doing things is also another challenge of ICT Integration. They felt it is difficult because it involves huge sums of money, planning, time disruption, organizational changes and so on. Most of the old teachers have the excuses that they are of old generation and have no time in the new generational ways of doing things (Idowu & Esere, 2013).

CONCLUSION

Summarily, the integration of ICT into teaching and learning to meet the global practices and to respond to the need of 21st century, cannot be over emphasized. ICT integration in education is a broad process of applying technology to the curriculum to improve teaching and learning process. The use of ICT plays numerous roles in education by changing the traditional method of teaching into more advance process. However, incorporating of ICT into teaching and learning has its own challenges rising from poor electricity supply, capital intensive, fear of change and lack of computer skill.

SUGGESTIONS

Based on the finding of the study, the following recommendations were made;

1. The government in collaboration with Nigeria schools should make a policy, implement and integrate ICT in the school curriculum and that each classroom should have basic ICT equipment and internet facility in good working condition at all time.
2. Also, training and retraining of Teachers/Staff. The government should organize ICT workshops, seminars and conferences that teachers/staff will be trained on how to become a computer literate and be skilfully competent in computer operations.
3. Furthermore, stakeholders and government should establish a Regional ICT Resource Center in each state which will serve as a training site for teachers, staff and resource personnel to be trained.
4. Government should make computer literacy a perquisite for employment in Teacher Education.

REFERENCES

Beckinsale, M. I. & Ram, M. (2006). Delivering ICT to Ethnic Minority Business: An Action Research Approach. Environment and Planning C; Government and Policy, (24, 4) 847-867

Canado, M. (2010). "The Transformation of Teacher and Students Roles in the European Higher Education Areas". *Journal of Language Teaching and Research, (1)2, 103-110*

Idowu, A. I., & Esere M. (2013). ICT and Higher Educational System in Nigeria. (8)21, 2021-2015

Ololube, N. P. (2018). Leadership use of Strategic Planning as a Tool for Successful Education Management. In N. P. Ololube (Ed.), *Handbook of Research on Educational Planning and Policy Analysis (pp. 1-10).* Port Harcourt Publishers

Oxfam Education Report (2002). A review of Good Practices in ICT and Special Education Needs in Africa

Shavinina, L. V. (2001). *A New Generation of Educational Multimedia: High Intellectual and Creative Educational Multimedia Technologies.* Larchmont, NY: Mary Ann Liebert, Inc.

Thierer, A. (2000). *Divided over the Digital Divide.* Washing D.C: Heritage Foundation.

Tongia, R. (2004). Information and Communications Technology (ICT). Retrieved August 5, 2015, from https://www.cs.cmu.edu/rtongiaICT4SD Ch 2--ICT.pdf