

## THE INTEGRATION OF INFORMATION COMMUNICATION AND TECHNOLOGY (ICT) INTO CLASSROOM INSTRUCTIONAL DELIVERY IN NIGERIA: PROBLEMS AND PROSPECTS

Aniah Anthony<sup>1,\*</sup>, Danladi I. Wushishi<sup>2</sup> and Helen Aniah<sup>3</sup>

<sup>1,2</sup>*School of Science and Technology Education, Federal University of Technology, Minna*

<sup>3</sup>*School of Agriculture and Agricultural Technology, Federal University of Technology, Minna*

\*Corresponding E-mail: [anthonyaniah@futminna.edu.ng](mailto:anthonyaniah@futminna.edu.ng) (Tel: +2348036195385)

**Abstract:-** *The paper focused on technology integration into classroom instructional delivery in Nigeria. The world has become technologically driven, globalized, competitive and competency based. Thus, for any Nation's educational system to remain relevant, there must be a redefinition of fundamental educational practices. Educational technology is interested in the utilization of Information and Communication Technology (ICT) facilities for the development and growth of various fields of human endeavors especially in finding solution to educational problems. It is on this premise that Nigerian education system is shifting from theory to practice using the platform of (ICT) to enhance learning outcomes. The paper reviewed the concept of technology integration, identified problems and prospects, draw conclusion while recommendations were proffered in line with the title of the paper. Among the recommendations given was that government should show keen interest in funding education sector for adequate provision of relevant ICT facilities in line with integration policies including training and retraining of teachers who are directly involved with classroom teaching and learning.*

**Keywords:-** *Integration, Technology, Classroom, Instructional Delivery, Problems and Prospects*

### Introduction

The integration of Information and Communication Technology (ICT) into classroom teaching and learning process is a growing field in the Nigeria education system. Although, over the past decades, government and education stake holders, parents and administrators around the world have regarded the use of ICT as an important issue in improving the effectiveness of classroom teaching and learning (Plump, 2009). ICT offers a veritable means of ameliorating or solving the pedagogical crisis in education industry. The incorporation of technology into instructional delivery is one of the most important challenges in the 21<sup>st</sup> century. Miller (2000) posits that technology based teaching is very essential and sees it as the most facilitative as a result of providing relevant examples and demonstrations; changing the orientation of classroom; preparing students for gainful employment; increasing the flexibility of classroom instructional delivery; increasing access and satisfying of public demands for efficiency. According to Miller (2000), the purpose of using technology in teaching is to give better value to students, this value should also impact on the learner's performance. Similarly, the integration of ICT into classroom creates a more inclusive learning platform which kindles interaction thereby removing passivity (Ibeh, Adamu & Owosani, 2007).

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 communication technologies are computer based tools used by people to work with information and communication processing needs of an organization. Its preview 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).



Miliken and Barnes (2002) also defined ICT 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. 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.

Technology is a catalyst for transformation of classroom instructional practices because it provides a distinct departure, a change in context that suggest alternative ways of operating e.g. shift from traditional instructional approach towards a mere eclectic set of learning activities that include knowledge building situation. Educational technology is considered to be a tool, piece of equipment or device - electronic or mechanical - that can be used to help students accomplish specified learning goals (Davies, Sprague, & New, 2008). Educational technology includes both instructional technologies, which focus on technologies teachers employ to provide instruction, it also focuses on technologies learners use to accomplish specific learning objectives. Redmann and kotrlik (2004), defined technology integration as employing the internet, computers, CD-Rom, interactive media, satellites, teleconferencing and other technological means to support, enhance, inspire and create learning. Furthermore, the authors posit that technology integration is the effective implementation of educational technology to accomplish intended learning outcomes. Integrating technology according to Bernauer (1995), is not about technology per se that result in improved student outcome but rather how the technology was used and integrated into instructional processes. He also attributed student increase proficiency in using technology for learning and achievement to teachers planning and expertise, stressing that true success must be measured in terms of improvement in teaching and learning, not merely using of technology. According to Barron (2006), technology integration in classroom instruction can be grouped into three main categories; technology for instructional preparation, instructional delivery and technology as a learning tool. When technology is used for instructional delivery, the teacher or student can use it e.g. teacher can present instruction by means of a projector, student may use computer assisted learning applications such as drill and practice, tutorial and simulations.

Levine (1998), emphasizes the importance of having a plan that is based on real school needs and one that is realistic, achievable, and effective. The plan should be produced, not for the sole purpose of putting technology in the classroom but to reflect the real needs of schools in order to make effective technology deployment and to produce enhanced learning environments. The involvement of all stakeholders in the preparation and execution of the plan has been identified as a catalyst in the integration process. Levine (1998), proposes the following as components of effective technology integration plan in schools:

- Formulating a planning team
- Collecting and analyzing data
- Formulating the visions, goals, and objectives
- Exploring available technology
- Determining training and staffing needs
- Determining budget and funding sources
- Developing an action plan
- Implementing the plan and
- Evaluation

### **Classification of ICT Tools and How They Can Be Integrated into the Instructional Delivery**

ICT tools are classified into five major groups namely:

1. **Audio Technology:** deals with sound only, such as audio CDS with recorded educational programmes that can be played on tape-recorder or tape-recorded for students to learn through it eg pronunciation exercises or oral English language testing.



2. **Audio – Visual:** This is a combination of sound and sight media technology, it uses the sense of hearing and seeing, examples include computer, television and motion picture films. They are source of motivation especially as the learner sees and hear the instruction at the same time.
3. This category of ICT tool is the web-based or on-line technologies which is usually used for facilitating of researches at all levels of learning.
4. Social media technology – this media is very important in facilitating teaching and learning. This has to do with face book and WhatsApp supported instructions.
5. The fifth category of ICT tool is mobile technology which uses tablets, smart phones and android phones, they are portable and provide ease of information and knowledge.

### Problems of ICT integration in Nigeria

Ilaonisi and Osuagwu (2010) explained that many factors limit the integration of ICT in Nigeria education system. These include paucity of ICT infrastructure and lack of access, inadequate funding and absence of funding allocation to technology, high cost of ownership and cost on the consumer and policy implication of mismatch between the advertised capabilities of ICT technology the aims of individual instructions among others:

1. **Paucity of ICT Infrastructure and Lack of Access:** The greatest technological challenge in Nigeria is how to establish a reliable cost effective internet connectivity. Issue of access to ICT networks need urgent attention to break this crippling access barrier confronting education in Nigeria. Some institutions have Campus Area Network (CAN) backed by wireless narrow band while others have only internet café with grossly insufficient computers based with 50:1 ration (fifty students to one computer). Web based education as a form of on-line, mobile and distance education requires reliable computer network broad band connectivity to interconnect offices, departments and centres to public internet via campus area network.
2. **Lack of Internet and Adequate Electricity Supply in Nigeria:** It is not surprising to note that secondary schools located in rural areas have no access to internet and are perpetually isolated and estranged from the world's super highways. Nearly all internet service providers in Nigeria are based in the urban areas. Also, it is true that irregular supply of electricity has almost crippled Nigerian economy and hindered progress of researches carried out by institutions, groups and individuals in the country. It is wrong for an establishment to embark on a project of integration without addressing power supply problem. It is even worse to embark on extensive ICT project within an educational institution without addressing power supply first. The average power supply in Nigeria in 2008 was about four hours per day which is grossly inadequate. Alternative source of power is stand-by generators, batteries, and solar panels. The truth is that most universities cannot foot the bills of maintaining several standby generators that can gulp down 10 – 30 litres diesel per hour neither can they purchase enough solar panel to go round the campus. Use of gas as booster is high, many subscribers cannot use internet effectively as there is hardly power supply to do as wished. When power is rarely supplied, the goals of transforming education through ICT becomes a dream, access to educational resources on demand remains a story, e- learning would not be sustained especially with the erratic power supply situation compounded by lack of access to technology.
3. According to Nwagwu (2003), all indicators point at chronic gross under funding at the school system. Hence, ICT integration issue of this magnitude and for effective development, there must be massive investment of resources in form of funds. The author concludes that this poor funding syndrome is a serious problem to curriculum implementation in Nigeria education. Onyeachu (2006), explained that no organization can function effectively without funds, he explained that in Nigeria, funds allocated for education is grossly inadequate. In the same light, Nwachuku (2005), lamented that the public sector of education has witnessed stagnation and decay which has affected implementation of a well-designed curriculum. A situation where there is no money for payment of teachers' salaries, purchase of equipment, books, furniture and other facilities, thus, teachers would not perform effectively.



4. Brain drain is another major challenge facing the development of ICT for education, research and development of any nation. Brain drain has resulted in the lack of critical mass of ICT engineers and scientist relevant for undertaking ICT related projects professionally. Other obstacles identified are lack of enabling policy and environment and a sound ICT road map and strategies by policy makers resulting in uncoordinated and unsustainable ICT development activities and time factor for intensive training of ICT personnel for enhance productivity (Okeyere & Osae, 2011).

### **Prospects of ICT Integration**

The global community is now being determined by the ease and speed with which people have access to data and how they can effectively use them to technologically improve their global outlook. Thus, the prospect of greater economic, social, educational and technological gains, both developing and developed countries, are bringing about education reforms, with a clear focus on ICT integration in education. Countries have been investing considerably in terms of money, expertise, resources and research to integrate technology in education as smoothly as possible so that the classroom environment is made more conducive for enhanced teaching and learning. Nations have recognized not only the positive effects of technology in education, but also the pivotal roles that it plays in securing jobs in the competitive job market of the 21st century. Prospective job applicants increasingly need to be computer-literate in order to qualify for job positions. Moreover, for countries to compete with each other in the global information-based and knowledge-based economy, they need a workforce that is skilled in the use of technology to gain the necessary competitive edge over one another. Hence, it is no longer a question of if technology should be integrated in the school setting, but a question of when and how to integrate technology so that it benefits all the parties concerned – students, teachers, administrators, parents and the community. Countries that fail to recognize and act according to the trends in new content and new methodologies in education and training may find it very hard to compete in the global economy (Delannoy, 2000).

Education all over the world may soon be based on digital technology to the effect that any teacher who is not digitally literate may not have a place in electronically driven classroom. Literacy is now synonymous with acquisition of ICT literacy skills. Another supposed benefit of ICT integration is learning while working. ICT offers unique opportunity of enabling working class learners the comfort of studying in their private offices or at home which in turn stand as bedrock of open and distance learning education (Wodi, 2009). According to Kanungo (2009), acquiring the capacity for ICT skills is necessary for cost-effective business transaction which include managerial, technical, organizational, personnel as well as infrastructure. The visible effort in meeting these challenges as Kanungo observed has been through the establishment of computer based literacy centres and cybercafé by private investors to compliment the effort of government in the provision of ICT infrastructure. In the same light, Osinibi (2000), sees ICT integration as promoting unity in diversity, he explained that people are linked together in a network of networks irrespective of location to communicate and exchange resources. The author observed that people are better informed through e- government leading to stronger democracy. Consequently, ICT gives Nigerian youths opportunity to compete favorably with their peers in other parts of the world.

### **Conclusion**

Globally, technology integration into classroom instructional delivery in the 21<sup>st</sup> century has become imperative because of its prospect in facilitating students learning outcome, addressing pressing issue of unemployment and advancement of nation. It is however stressed that the above identified constraints to technology integration such as epileptic supply of electricity, technology experienced staff, inadequate course content, lack of access to ICTs, lack of internet outlets to classrooms among others if not adequately addressed through adequate funding and provision of these basic technology resources will slow down the pace of success to the programme.



## Recommendations

1. Government should pay close attention to funding as it is very crucial to the success of ICT integration in the education sector and other relevant areas of national advancement.
2. There is urgent need for training and retraining programmes for better skills acquisition to enhance productivity especially in this era of life - long learning and to keep end users abreast with the latest techniques in ICTs.
3. There is need for the establishment of computer literacy centres and cybercafé by private investors to compliment the effort of government in the provision of ICT infrastructures.
4. Electricity is the major source of power for most ICT equipment, it is therefore important to encourage its availability irrespective of location, urban or rural setting in other to enhance effectiveness of ICT integration programme.
5. All ICTs internet service providers based in Nigeria should be encouraged by government to extend their services to rural areas rather than limit themselves to urban settings if the impact of integration must be felt in the entire nation.

## References

- Barron, A. E. (2006). *Technologies for education: A practical guide* (5 ed.). Westport CT: Laboratories Unlimited.
- Bernauer, J. A. (1995). *Integrating technology into the curriculum: First year evaluation*. A paper presented at the annual meeting of American Educational Research Association, San Francisco, CA (ED), 224-385.
- Davies, R., Sprague, C., & New, C. (2008). Integrating technology into a science classroom: An elevation of inquiry – based technology integration. In Sunal, D. W., Wright, E. L. & Sundberg, C. (Eds.). *The impact of technology and the laboratory on K- 16 science learning* [Research in Science Education Series], pp. 207 -237.
- Delannoy, F. (2000). Teacher training or lifelong professional development? Worldwide trends and challenges. *TecKnowLogia*. 2 (6), 10 -13.
- Ibeh, A. E., Adamu, B., & Owoseni, A. A. (2000). Innovation in the teaching and learning of adults: The changing role of the teachers of adults in a connected learning environment. *Ikere Journal of Education*, [Special Edition on ICT], 79-87.
- Iloanus, N. O., & Osuagwu, C. C. (2010). An evaluation of the impact of ICT diffusion in Nigeria's higher education system. *Journal of Information Impact*, 10 (1), 25-34.
- Kanungo, S. (1999). *Making information technology work*. London: Sage Publications.
- Levine, J. (2001). Planning strategically for technology integration. Retrieved from [http://www.coe.uh.edu/insite/elec\\_pub/HTML1998/el\\_levi.htm](http://www.coe.uh.edu/insite/elec_pub/HTML1998/el_levi.htm).
- Mejiuni, E., & Obilde, A. (2005). Need for ICT integration for effective instructional delivery in Nigerian Colleges of Education. *An online Journal of Education and Practice*. 6 (3).
- Miliken, J., & Barnes, L. P. (2002). Teaching and technology in higher education: Student perceptions and personal reflection. *Computers and Education*. 39 (3), 207 – 317.
- Miller, J., W., Martineau, L. P., & Clark, R., C. (2000). Technology infusion and higher education: Changing teaching and learning. *Innovative Higher Education*. 24, (3).
- Moursand, & Bielefeldt, (2015). Need for ICT integration for effective instructional delivery in Nigeria Colleges of Education. *Journal of Education and Practice*. 6, (3).
- Nwachuku, V. C. (2005). *Issues of standards and sustainability of quality education*. A paper delivered to the seminar of the all Nigeria conference of principals of secondary school, Abia State branch at kolping conference Centre, Umuahia on 20th September.
- Nwagu, O. (2003). *Suggested organization for African school*. Ibadan: Longman.
- Onyeachu, E. (2006). Teachers' characteristics and school curriculum implementation in Nigeria secondary schools: A theoretical review. *Journal of the Nigerian Academy of Education*. Nigeria 10 (1), 118-120.

- Okeyere, A., & Osae, E. (2011). Issues and challenges in the use of information communication technology (ICT) in education. *Journal of Information and Knowledge*. 2 (1), 1-19.
- Osinibi, S. (2000). *Getting value through shared ICT infrastructure and integrated application*.
- Plump, T., Anderson, R. E., Law, N., & Qualex, A. (2009). *Cross-national information and communication: Technology policies and practices in education* (2 ed.). Charlotte, N. C: Information Age.
- Wodi, S. W. (2009). The concept of educational technology: Problems and prospects of information and communication technology ICT in Nigeria. *International Journal of African Studies*, 4 – 9.
- Redmann, D. H., & Kotrlik, J. W. (2004). Analysis of technology integration in teaching and learning process in selected career and technical education programs. *Journal of Vocational Education Research*. 29, (1).