

Information and Communication Technology: A Teaching and Learning Tool – Its Challenges and Prospects

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Abstract

Nowadays, ICT usage in the classrooms is seen as a tool to enhance teaching and learning skills. ICT helps teachers to develop an effective planning and an organizational skill. On the other hand, it exposes the students to relevant and related materials that can be used to buttress on areas of difficulty. Despite ICT numerous advantages in the classrooms, there are several challenges that hinder its usage and prospects that are yet to be discovered and utilized in education. This study aims to throw more lights on those ICT usage challenges and prospects in education and provide appropriate solutions. The study covered some ICT challenges in education like poor networking, limited accessibility, and lack of technical support and training amongst others. The study concluded that sufficient ICT facilities and resources will enhance instructors' teaching skills and students' technical-know-how and competencies. It was then recommended that government should provide enough ICT facilities and resources at the tertiary level and should ensure the accessibility and acceptability of these ICT tools.

Keywords: *Information and Communication Technology, Educational Management, Training and Development.*

Introduction

Nowadays, most organizations rely heavily on information and communication technology (ICT) (Zhang, 2013). In early 1980s, computers usage became famous in school and scholars believe that ICT is an imperative tool in education for upcoming learners because modern technologies serve as alternative means of improving classroom teaching and learning. New technologies do not only

improve classroom learning but also enhance academic curriculum and provide opportunities for student-teacher effective communication across the globe. ICT changes teaching techniques and boost students' line of thought. This potency is easily accomplished, Akhilele (2021) cites Dawes (2001) states that problems arise during teachers' attitudinal change and implementation under adverse conditions. Because ICT is so important, to identify potential challenges of ICT integration in schools would be a critical step towards enhancing education standard. Yusuf and Onasanya (2013) assert that teachers appear to realize the benefits of ICTs as they continue encountering various challenges when in educational process.

Teaching is essential to the development of education, particularly higher education. The goal of teaching is to encourage learning. As a result, teaching and learning refer to a process that allow numerous stakeholders to participate in students' knowledge development and skills enhancement and build a variety of learning perceptions that will bring about a change in their actions and attitudes. Learning environment, tasks, students' attitudes and behaviours toward teachers, teacher behaviour like personality, teaching style, and many others are examples of variables.

Technology is an electronic device which allows individuals to manipulate data like words, sound, images, or numbers. It has enabled people to communicate with people all over the world within a twinkling of an eye. Technology enables teachers and learners to share thoughts, improve knowledge, solve basic problems and concrete make decisions, ICT is critical in educational activities. Owhotu (2006) cited UNESCO that defines ICT refers to the tools and processes used to obtain, organize, store, retrieve, manipulate, present, produce, and share information.

ICT was born from the marriage of two technologies - communication and computer technology are examples of these technologies (Edwards, 2007). Communication technology includes television, radio, and phone, whereas computer technology includes computers, wireless, satellite, and internet. Computer technology receives, transmits, and processes, while communication technology provides the mechanism by which information is sent. It also provides for information storage and retrieval. Telecommunications, storage, audio-visual systems, and computers and software are all connected by ICT, allowing users to access, store, send, and alter data (Okeh & Opone, 2007). As a result, ICT encompasses both ancient and contemporary ICTs such as

telephones, radios, and televisions, as well as satellite, computers, wireless technology, and internet. The integration of these is what transformed the world to a global village. ICT enables worldwide interchange of views, important to develop relevant educational initiatives, training of labor forces, and comprehending difficulties relating to both education and economic growth (Ololube, Ubogu & Ossai, 2017). Many Nigerian higher institutions are now striving to utilize ICT as teaching and learning tools. To collaborate learning environment, ICT must be inclusive in its teaching and that will enable the students to gain information (Ifinedo, 2006).

Education encompasses around the level of interactions that exist between teacher and students in a suitable and conducive environment whereby the teachers use techniques and media to transform the students' skills, knowledge, skills, behaviour and attitude. Prior to the twenty-first century, traditional teaching method was adopted for teaching and learning such as the face-to-face communication. In some parts of Nigeria, is ancient method of teaching is still in use (Kayode, 2019). It is similar to pragmatic rhetoric practiced (Oduma & Chika, 2014) whereby communication is done directly to the recipients without any reasonable and acceptable fact as a response. In this sense, the teachers are seen as experts while students' ideologies and thoughts are not enhanced. Rhetoric pragmatic process of communication is unidirectional as it flows from teachers to students whereby the students are not encouraged to express themselves and gain self-confidence and self-knowledge (Galbreath, 2000). It is common in tertiary institution and it is viewed as a teacher-centered method (lecture method).

ICT is an energetic tool that has transformed many areas of human life. Considering its impact on banking, medicine, travel, tourism, business, engineering, law, and constructing in the last couple of decades (Yusuf and Onasanya, 2013). ICT is an essential world modern component. At the moment, society and culture must be reshaped to tackle the needs of global age. Institutions, particularly those in advanced countries, use ICT for teaching and learning. If ICT can help with unified equity in education, access to higher education, delivering equality in research and education, professional development for teachers, and much more efficient education management, administration, and governance.

ICT in Tertiary Institutions

Nigerian education has witnessed various developments especially in the area of ICT usage (Akhilele, 2021). In the National Policy on Education (Federal Republic of Nigeria, 2004), the Federal Government of Nigeria recognizes the importance of ICTs in today's world and has integrated ICTs into Nigerian education. To achieve this goal, the fourth edition of the National Policy on Education (2004) states that the government provides infrastructures and manpower development in all institutions; computer education has been designated as a pre-vocational elective as well as a skill - based elective. The National Universities Commission (NUC), the regulatory body of all Nigerian universities, mandated that universities should have a computer to four students and a computer to two lecturers below the grade of Lecturer 1, a computer to every Senior Lecturer, and a notebook computer to every Professor/Reader. The National Open University of Nigeria (NOUN), founded in 2002, has established 55 study centers throughout the country. NOUN's ambition is to establish study centers not only in each of the federation's 36 states, but also at local government levels, in order to make tertiary education accessible to all citizens. Each NOUN study center has various computer labs café with at least 25 computers connected by a local area network (LAN). The centers have not been linked to NOUN's REPRODA (repository, reproduction, distribution, and administration headquarters) via a wide area network (WAN) in order for the following activities to be mainstreamed:

- i. Assessment and testing
- ii. Training and learning
- iii. Communications (e-mail, chat, forums)
- iv. Interactive sessions
- v. Access to virtual library
- vi. Internet access
- vii. Other computer applications

The WAN is used by NOUN to deliver virtual classroom courses to all of the study centers. Facilitators (instructional and tutorial) and student counselors are assigned to each study center to provide guidance and counselling to students. The counselors are recruited within the community or from neighboring communities. NOUN's ICT applications currently include: student record

management (on-line application, admission, registration, and examination procedures) System for managing students' learning (e-learning and the virtual library) interaction (SMS, e-mail, video-conferencing, and Internet) Courses in human resources and finance are delivered. These two courses' pdf files are already available online. NOUN's goal is to eventually use REPRODA to package all learning materials as an electronic form. NOUN received government budgetary allocation for its programs for the first time in 2007. To date, NOUN has primarily relied on outside funding to carry out its projects and programs. Other government agencies that use ICT lament the poor funding as well.

Challenges of ICT as teaching and learning medium

ICT integration is a complex process that can be fraught with difficulties. In education sector, it appears that ICT utilization has little impact. The Nigerian education system has struggled in recent decades due to various challenges of ICT integration in education (Esoswo, 2011). The following are some of the most significant challenges:

- 1. Poor network connection and lack of accessibility:** A significant obstacle that stops instructors from incorporating new technologies into education, according to various research papers, is a lack of access to resources, particularly home access. Several research studies have identified various reasons that cause the inaccessibility of technological tools. Teachers were of the opinion that it was difficult accessing computers in their schools (Sicilia, 2005). These reasons include the need to schedule computers in advance, which instructors sometimes fail to do, and the inability to book them for many periods in a succession when working on multiple projects with students. Few of these teachers have access to ICT materials while most of them do not. Becta (2004) opines that lack of ICT resources is often not due to unavailability of software, hardware, or other ICT components within the school. It could be due to a number of factors, including low-quality hardware, poor resource organization, incompatible software, or a lack of personal access for teachers. According to studies, the most significant barrier to teachers' use of ICT in the classroom is a lack of access. These barriers included an insufficient number of computers

and accessories, no internet connectivity, age or slowness of ICT systems, and a scarcity of educational software in the school.

- 2. Lack of technical support:** Teachers cannot overcome the obstacles that hinder them from utilizing ICT on their own unless they have adequate technical support in the classroom (Lewis, 2003). Technical issues were found to be major barriers for teachers (Sicilia, 2005). These technical barriers included waiting for websites to open, failing to connect to the internet, printers not functioning, malfunctioning computers and teachers having to work on old computers. “Technical barriers impeded the smooth delivery of the lesson or the natural flow of the classroom activity” (Sicilia, 2005). Korte and Husing (2007) argued that ICT support or maintenance contracts in schools help teachers to use ICT in teaching without losing time fixing software and hardware problems. Becta (2004) report stated “if there is lack of technical support available in a school then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns”. In teaching, several studies indicated that lack of technical support is a main barrier to using technologies. According to Gomes (2005), ICT integration in teaching needs a technician and if one is unavailable the lack of technical support can be an obstacle. Sicilia (2005) argued that whatever kind of technical support and access teachers have and whether they have twenty years of experience or are novices to the profession, technical problems generate barriers to the smooth lesson delivery by teachers.
- 3. Ineffective training:** Pelgrum (2001) found that there was an inadequate training opportunities for teachers in using ICTs in a classroom environment. Recent research found that the main problem with implementing new ICT in education was the insufficient amount of in-service training for teachers. According to Becta (2004), the issue of training is certainly complex because it is important to consider several components to ensure training effectiveness. The result of the research by Cox (1999) showed that after teachers had attended professional development courses in ICT they still did not know how to use ICT in their classroom; instead they just know how to run a computer and set up a printer. He explained that this is because the course only focused on teachers acquiring basic ICT skills and did not often teach teachers how to develop the pedagogical aspects of ICT.

Fundamentally, when there are new tools and approaches to teaching, teacher training is essential (Osborne and Henessy, 2003) if they are to integrate these into their teaching. However, Teachers who get insufficient or improper training are not adequately prepared nor confident in their ability to fully integrate ICT into the classroom.

- 4. Limited time:** In some latest surveys, many instructors are competent and confident in utilizing computers in the classroom, yet they still utilize them sparingly due to a shortage of time. Time constraints and the difficulty in organizing enough computer time for courses were noted by a large number of studies as a barrier to teachers' use of ICT in their classrooms. According to Sicilia (2005), the most common problem that instructors mentioned was a lack of time to organize technological classes, investigate numerous internet sites, or examine various features of educational software. Becta's study (2004) found that inadequate timing influence teachers' effectiveness and efficiency at workplace; hence, appropriate time is needed to locate internet advice, preparing lessons, exploring and practicing using technology, dealing with technical problems, and receiving adequate training.
- 5. Unskillful teacher:** Another challenge linked to teacher confidence is teacher competency in integrating ICT into educational practice. Many teachers lacked computer experience and talents, and were unenthusiastic about the changes and integration of extra learning that came with bringing computers into their teaching practice (Newhouse, 2002).
- 6. Capital-intensive:** It is expensive to train students on ICT applications, and couple with the country's current financial commitment and stand, it may be difficult to achieve.
- 7. Lack of effective process to ICT implementation:** To incorporate ICT into the functions of an institution is a complex and needs to be conceptualized from the onset.
- 8. Administrative assistance:** To successful integrate ICTs in education, administrators must provide the enabling facilities and safeguarding policies for sustainability. important factors in the effective adoption of ICT.
- 9. Inadequate fund:** Many underdeveloped nations, such as Nigeria, are finding it difficult to support the costs of integrating and using ICT in teaching and learning. Higher education institutions might use lobbying to persuade their governments to provide extra cash and

diversify their financing sources to address this. Other difficulties include unreliable power supply and high equipment costs etc.

Prospects of ICT as teaching and learning medium

The prospects of ICT as teaching and learning medium are;

1. When ICTs are used correctly in education, they can improve basic abilities in reading, writing, science and mathematics by enriching, speeding up, and deepening them.
2. ICT encourages students to learn new things and expand their knowledge which enable them to connect academics to work activities and experiences.
3. ICT enables students to be technically inclined workforce with a positive attitude toward technology use, as well as the capacity and competency to perform in a seamless knowledge-based economy.
4. It has been discovered that ICT network technologies support innovative teaching, activate learning, and instigate students and teachers to become active scholars and learners.
5. ICT helps teachers reduce their workloads through effective preparation of lesson notes and worksheets; help to write students' reports and education plans, collate and analyze students' attainment data for target setting, and record and analyze attendance and disciplinary data.
6. It can be used to obtain subject-specific instructional content and to ensure global collaboration with teachers. Furthermore, teachers can bring up-to-date topic knowledge to the classroom.
7. ICT, such as the internet, can aid in teacher development. E-learning can be used in the context of teacher development for knowledge development through courses, seminars and so on. There are a few global tools to online resources that can help instructors' teaching skills. Anderson (2004) states that these include ICT in education, established by UNESCO in Paris, the Education Network of Australia, developed by the Education Institute in Adelaide, and the Institute of Education Technologies in Education, developed by UNESCO in Moscow. Users can use these portals to post materials, ask questions, and submit assignments.

8. Using ICT, teachers and students are attempting to change the focus from teacher-centered to student-centered learning, in which learners are active involved in learning process, share and produce knowledge, and contribute to learning through collaboration. As a result, rather than simply transmitting knowledge, teachers become learning facilitators and collaborators.
9. For instructional delivery, ICT can be multi-media. Textual, audio, visual, and audio-visual content can all be used to deliver instructional content. As a result, equity can be ensured for all types of learners.
10. ICT can help students provide opportunities for student-construct learning, improve their problem-solving skills, boost student collaboration, vocational and professional skills enhancement, prepare students for most vocations and careers, and boost their self-esteem and attitude (Cradler and Bridgforth, 2004).
11. ICT attempts to eliminate distance barriers with its Internet facilities; students also gain access to information even in remote locations, thereby facilitate and initiate learning at any time and from any location. With this provision, students can learn on their own. This helps slow learners understand concepts that are difficult for them to grasp.
12. Teleconferencing facilities are also important in bridging the learning gap. This removes the physical distance barrier that would have hampered effective use of ICT tools.

Conclusion

With the right strategies, ICT is a powerful tool to improve teaching methods, research and learning in Nigerian schools. Classroom teachers, school administrators, curriculum developers, researchers, and others can use ICT to improve school administration and provide a solid foundation for innovative education in Nigeria. ICT usage in teaching will significantly improve the standard of education. To meet the demand for teachers, teachers, trainers, and policymakers will need to develop a well-designed training program.

Recommendations

Based on the above discussions and views, to achieve education for all, these recommendations are made:

1. ICT investments should always be used to promote ICT development and basic skills like operational competencies, communication, problem-solving, and critical thinking, problem
2. Teachers' professional development should be prioritized to improve lecturers' competencies in ICT applications
3. Integration of ICT into the teaching profession and educational programme must be a must. This will necessitate the creation of a document and provide a framework for ICT in education, as well as a proper description of the essential standards that are set for successful technology integration.
4. Teachers should be adequately trained on ICT usage because Nigeria's education system is gradually prioritizing ICT literacy.
5. ICT usage in Nigerian tertiary institutions should be monitored and evaluated on a regular basis in order to meet a range of educational objectives.
6. Stakeholders should analyze and mitigate risks, prepare for, and implement essential change management procedures to express the added value of ICT from the innovations.
7. Tertiary institutions should be well equipped to face the difficulties and possibilities that ICT will bring by aiding education systems in achieving not just the Millennium Development Goals, but also boosting the world's technological and knowledge-based economy.
8. Well-developed standards should be in place to guide the implementation of ICT programme for teachers
9. Digital and Internet facilities should be accessed by all stakeholders and be more adequate in schools.
10. The establishment of ICT resource centers for teachers in each local education authority, as well as the provision of necessary ICT facilities in schools as envisioned in the National IT policy.

11. Private-public partnerships should be encouraged in the delivery of ICT literacy to teachers in rural areas.
12. Education administrators and staff in ministries and education departments should be trained to be ICT literate and competent alongside teachers.

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