ESUT Journal of Education (EJE)

Vol. 6 Issue 1, May 2023

Roles of Information Communication Technology (ICT) in the Achievement of Sustainable Development Goals in Nigeria.

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ABSTRACT

The study examined the roles of Information Communication Technology in the achievement of Sustainable Development Goals in Nigeria. Teaching is becoming one of the most challenging professions in our society today where knowledge is expanding so rapidly that modern technologies demand the use of Information and Communication Technology (ICT). Through ICT, students' understanding and knowledge in several areas have been increased, thus creating an environment where creative learning is the rule. ICT offers a range of fundamental and methodological contributions that empower sustainability through various tools and more generic models. These technologies are fundamental enabler of economic prosperity, recently identified among the main facilitators for the three pillars of sustainable development: social, economic and environmental are the principal enablers of the SDGs 2030. There are developments in the Nigerian education sector which indicate some level of ICT application in the secondary schools. However, roles of ICT in education are online learning, access to all, higher order thinking, motivator of learning, cooperative learning etc. Meanwhile, some causes of low ICT applications in Nigeria School system are epileptic power supply, inadequate ICT facilities, inadequate manpower etc.

Keywords: education, Information Communication Technology, Sustainable Development Goals, Development.

BACKGROUND

Teaching is becoming one of the most challenging professions in our society today where knowledge is expanding so rapidly that modern technologies demand the use of Information and Communication Technology (ICT). ICT has become within a short time one of the basic building blocks of a modern society. Many countries now regard understanding ICT and mastering its basic concepts as part of the core of education (UNESCO, 2014). Information and communication technology (ICT) is an innovation that has broken all nation and international barriers and turned the world into a global village. The reason for this is because ICT has made information available to people of different colours and race, groups and organizations everywhere in the world today. Innovation is the introduction of something new, a new idea, method, or device. More so, innovation is often viewed as the application of improved solutions that meet novel requirements, unarticulated needs. Such innovation takes place through the provision of more-effective products, process, services, technologies, or business models made available in the market, government and society. The term "innovation" can also be said to be something unique and more current and thus original, that breaks into the market or society (Wikipedia, 2018).

ICT are electronic technologies used for information storage and retrieval. Development is partly determined by the ability to establish a synergistic interaction between technological innovation and

human values. The rapid rate at which ICTs have evolved since the mid 20th century, the convergence and pervasiveness of ICTs, give them a strong role in development and globalization (Nwagwu, 2016). ICTs have a significant impact on all areas of human activity (Brakel and Chisenga, 2015).

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning, and research (Yusuf, 2015). A great deal of research has proven the benefits to the quality of education attainable with the application of ICT in teaching and learning (Egwuatu 2018). ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change.

In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. Such ability must include ICTs in the global village. The Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury, but a necessity for development. Unfortunately, many developing countries, especially in Africa like Nigeria, are still low in ICT application and use (Akin 2017).

According to Eche (2021), ICT for education sustainability has helped students and learners across the world access educational material more effectively and efficiently. ICT has been a tool that has enabled them to discover new areas of interest, solve problems, and discover new perspectives. Through ICT, students' understanding and knowledge in several areas have been increased, thus creating an environment where creative learning has been taught (Ani 2019). This is mainly through applications that have been designed purposefully to meet a variety of needs. There are some main characteristics that we will have to look into creativity, capability, and autonomy (Synth 2022). Autonomy dictates that students take control of their learning. They tend to become used to working by themselves and in conjunction with others without necessarily having a teacher's input. Through this, students can then develop confidence in specific disciples hence nurturing their capabilities.

On 25th to 27th of September 2015, the heads of state and high-representatives of United Nations member States agreed on the Sustainable Development Goals (SDGs) which supersede the Millennium Development Goals. The Millennium Development Goals (2000-2015) can be regarded as one of the most important and successful initiatives to eradicate poverty in modern history. The eight crystallized goals of the MDGs have further been translated into practical steps which have liberated over one billion people from extreme level of poverty and have achieved better standard of living in many parts of the world. Without any doubt one cannot neglect the eminent role of science, technology, and innovation as well as the dissemination of these new technologies in most of the practical steps leading to a society where no one should be left behind.
Technology innovation and sustainability can mutually reinforce one another. As technological innovation is recognized as the main driver of socioeconomic growth, it can also play a critical role in supporting the successful implementation of the United Nations' Sustainable Development Goals (SDGs). When used effectively, technology provide efficient solutions for development challenges from the local to the global level.

Information and Communication Technologies (ICTs) have become, critical in transforming the educational, social and

economic development of any society. Over the past years we have seen emergence initiatives and organizations dedicated to advancing technology for the benefit of sustainable development.

ICT offers a range of fundamental and methodological contributions that empower sustainability through various tools and more generic models. These technologies are a fundamental enabler of economic prosperity, recently identified among the main facilitators for the three pillars of sustainable development: social, economic and environmental and the principal enablers of the SDGs 2030 (Sachs, 2015).

Successful integration of technology to enable smart global sustainability requires a deep understanding of the potential of technologies and their socio-technical impacts, as well as their cultural and ethical influence, plus the identification of additional existing or emerging enablers for sustainable development to accelerate action on SDGs. As an example, such tools can help many sectors like education, healthcare, energy, etc.

ICT has immense potential to speed up, scale and increase the rate of diffusion in a vast range of cutting-edge technologies, applications and platforms across sectors. It can also dramatically reduce the costs of service delivery, helping low-income countries to achieve key development milestones while contributing to a growth economy and social well-being of the people.

ICT provides an optimized decision support system by leveraging massive data, analytics, and contextual management to scale and integrate sustainable ICT applications for various markets effectively. While incorporating systemic approaches and strategic projects, this enabler empowers computational modeling and strategic decision making. It also helps to generate holistic models, integrated tools, strategies and policies as well as implementation of the SDGs.

To achieve the SDGs, ICT needs to be combined with innovative policies, services, and solutions in the society. It can be a powerful means of implementation in many significant ways:

- *Accelerate up-scaling services in health, education, financial services, smart agriculture, and low-carbon energy systems.*
- *Accelerate institutional learning through online communities.*
- *Economizing resources and reducing the costs of services delivery upgrading the quality.*
- *Reduce deployment costs addressing urban and rural realities.*
- *Drive progress in many sectors and improve existing technologies with innovation, connectivity, productivity and efficiency across areas. Top six sectors that will be significantly impacted by ICT are education, energy, manufacturing, buildings, agriculture and health.*
- *Enhanced public awareness and engagement (Opeke,2014)vol 4(7)p121-130*

The aim of the SDGs is to set the objectives for driving forces all over the world to tackle the world's largest challenges such as poverty, inequalities and achieving sustainable economic growth (Nwankwo, 2019). The agenda comprises 17 SDGs which are further reviewed to 169 targets addressing education, economic, social and environmental development issues.

For any organization to develop speedily according to the SDG initiatives, there must be high standard of knowledge or information sharing mechanism among the

members. Knowledge sharing has become an important strength in today's information and knowledge based economy, this is because it is commonly seen as contributing significantly to organization, group and individual performance. Knowledge is a process where individuals mutually exchange their ideas and jointly create new insight. Knowledge sharing (KS) is defined as practices and activities, the sharing of information and exchange of best practices in the achievement of a set goal at a given point in time (Opeke, 2014). The industrial and technological expertise of any nation, Nigeria not excluded is measured to a large extent with level of education attained by her citizens at all levels. Simply put, literacy is the backbone of development.

Egbo (2021) stated that ICT or Information and Communications Technology broadly refers to tools and services that handle and disseminate information. Some of the most common examples of ICT are mobile phones and televisions. ICT is widely used in our everyday life, and its need is ever-growing in the education sector. Images, audios, videos, presentations, or a combination of these used for teaching constitute ICT in education. Technology in education isn't something new, but not many have information about ICT in education industry. This is because ICT comes with several constraints, one of which is ensuring access to electronic devices for every kid. But with more institutes investing in ICT, the problem should soon be resolved.

Objectives of using ICT in Education

Valsco (2020) stated that the objectives of ICT in education include but not limited to the following:

- Providing accessibility through online medium of education.
- Improving the quality of teaching, especially in remote areas.
- To increase transparency in the education system.
- To strengthen the policies, rules, and laws in the education system.
- To analyze the learning and participation of the students and measure its effectiveness.

The roles of ICT in Education

The roles of ICT in education according to Valsco (2020), Moma (2018) are as follows:

Online learning

ICT and its tools had led to the emergence of online learning. Through this, the teachers and the students are learning innovative ways in the education process. Online learning has gained popularity amidst the Covid-19 pandemic to ensure that the learning continues. ICTs have looked after that education reaches through it worldwide and even in remote areas. No matter where the students are, it has ensured that every learner derives its benefits.

Accessible to all

ICT in education allows accessibility to all types of learners to participate in learning activities. All students can learn through the material provided, even the special needs students can maximize the benefits through the usage of ICT. ICT has also covered issues like the "digital divide" and allows even less fortunate people to access the tools for their educational needs and enhance their learning outcome.

Higher-order thinking & skill developments

ICT promotes high order thinking and reasoning skills. These skills enabled the process of evaluation, planning, monitoring, controlling, reflecting, etc. To use ICT tools effectively, one must be able to explain and justify the solutions to the problems. For using ICTs, the students should be able to discuss, test, and evaluate the strategies and methods they use.

Encourages collaboration
ICT fosters collaboration as children work collectively. It also enhances communication skills as they discuss, talk, and learn together. All you need is a laptop, tablet, or desktop computer to understand it's working. ICT tools open up the doors for developing language through fostering communication.

Motivates learning
ICT motivates children towards learning. Children learn better through the usage of technology. They get mesmerized with technology tools and get motivated to learn effectively in the classroom or at home.

More economical, the higher speed of delivery and wider reach
ICT tools are more economical, and the speed of delivering content is also high. Through ICTs, the number of learners increases, thereby reducing the overhead cost of investment.

Multiple teaching functions and diverse audiences
ICT involves multiple functions like diagnosing and solving problems for accessing information and knowledge about various contents. It can be useful in drills and practices also.

Uniform quality
ICTs act as a great equalizer by producing uniform quality content for the rich and the poor, the urban and rural people. It produces good quality content for all.

Facilitates cooperative learning
ICT facilitates cooperative learning by encouraging dialogue, discussions through a more participative classroom environment.

Application of ICT in Nigerian Secondary Schools System
There are developments in the Nigerian education sector which indicate some level of ICT application in the secondary schools. The Federal Government of Nigeria, in the *National Policy on Education* (Federal Republic of Nigeria, 2013), recognized the prominent role of ICTs in the modern world, and has integrated ICTs into education in Nigeria. To actualize this goal, the document states that government will provide basic infrastructure and training at the primary school. At the junior secondary school, upon which computer education has been made a pre-vocational elective, and it is a vocational elective at the senior secondary school. It is also the intention of government to provide necessary infrastructure and training for the integration of ICTs in the secondary school system.
That notwithstanding the above effort being made by government at driving the application of ICT in the school system there is still evidences of low compliance to the application of ICT in teaching and learning in Nigerian Secondary Schools caused by a number of factors thus:

Reasons for Low ICT Application in Nigerian Secondary School system
The low rate of ICT adoption and application in Nigerian secondary schools is attributable to several factors. Some of the factors are as follows:

1. **Epileptic power supply:** Electricity failure has been a persistent factor militating the ICT application and use in Nigeria.
2. **Inadequate ICT facilities in schools:** low numbers of computers and peripheral devices inhibit deployment, hence, a challenge to the integration of technologies in Nigeria Schools. Similarly, unavailability of some ICT components in the schools hampered teachers' use of ICTs.
3. Inadequate ICT manpower in the schools was also indicated to be one of the main problems confronting Nigeria and its ICT programmes in the schools. Teaching as a profession in Nigeria is

considered to be for poor people, therefore the few professional that are available prefer to work in companies and industries where they can earn better salaries. With this deplorable condition, teachers are not motivated to go the extra mile in assisting the students to acquire ICT education.

4. High Cost of ICT Facilities was also observed to be one of the factors which influence provision and use of ICT services (Adomi, 2016). The cost of computers is too high for many to afford. Monthly Internet rates are exorbitant and the charges for satellite television are unaffordable for most people in Africa. This has made it difficult for Nigerian secondary schools to acquire and install ICT facilities for the use of teachers and students.

Conclusion

The classrooms of the 21st century are rapidly changing with the help of technology. ICT has revolutionized the way the education industry functions. But while it is extremely beneficial, the proper use of ICT is also equally important. ICT plays a significant role in the field of education. It helps teachers to adopt the tools, provide and disseminate effective knowledge to the students. It implemented the principle of life-long learning.

ICT in schools effectively promotes the culture of learning by sharing experiences and information with others. It has developed technology literacy among students. It supports activities involving information. These activities include gathering, processing, storing, and disseminating information. The **roles of ICT in the education sector** are huge, and soon it will be an integral part of all school systems. Along with implementing the tools, it is necessary to train the educators to harness the true potential of ICT. Digital literacy among teachers and students transforms the way we use technology to learn. With ICT, we can build school systems that are more efficient, cost-effective, and inclusive of everyone.

Recommendations

Relying on the findings of this study, in order to improve on the roles of ICT in the achievement of SDGs, the following recommendations are made.

1. There is need for both government, corporate bodies and individuals to invest more in ICT and related technologies as means of not only solving accessibility problem but improving on the presence of the facilities especially in the classroom and computer lab for sustainable development.

2. There is need to install and maintain internet connection in the schools and connect more computers to the internet for students use. The schools should consider having ICT resource centers where all software can be accessed by the students.

3. Training in ICT skills should not be limited to Ms Office suits; the schools should go ahead to integrate the other programs and packages as recommended by UNESCO curriculum for schools. Clearly a basic level of ICT skill must be achieved but this should be followed by an integrated approach to ICT and learning. The aim should be for embedding ICT firmly into the teaching and learning process so that it is no longer considered a separate and discrete element. Such changes may offer the potential to improve on teaching and learning using modern technology, thereby driving faster, the achievement of SDG in Nigeria Education System.

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