ATTAINING SUSTAINABLE DEVELOPMENT IN NIGERIAN EDUCATION SYSTEM: THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY

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ABSTRACT

Information and communication technology (ICT) stimulates development. In the area of education, ICT is fundamental to reading, writing and computing with a very strong capacity to provide best possible output in education for teachers and learners. Despite this widely acclaimed use of ICT in education in the developed world, its use is limited in Nigeria. The purpose of this paper is to explore the role of ICT in attaining sustainable development in education. The paper discusses sustainable development, ICT, and education as well as the policy for ICT in education in Nigeria. Furthermore, the paper examines the link between ICT in education and sustainable development. Based on some empirical evidence, the role of ICT in education for the attainment of sustainable development in education was examined. The challenges were discussed and conclusion and suggestions were offered.

KEYWORDS*: Technology, ICT, Sustainable Development, ICT in Education*

INTRODUCTION

The United Nations (UN) conference on Human Environment held in 1972, 1987, 1992, and in 2002 provided the basic framework for the promotion of sustainable development through the adoption of Agenda 21 and a number of declarations aimed at the promotion of the broad objectives of global sustainability through concrete project implementation. The Johannesburg Plan Implementations, for example, recognized the crucial role that education plays in the promotion of sustainable development and declared the years 2005 to 2014, the United Nations Decade on Education for sustainable development. The argument for sustainable development has yielded rich dividends in almost all matters related to education. This informs the calls for the promotion of sectorial applications of ICT for eradicating poverty and improving quality of life. ICT can support the implementation of Sustainable Development Goals in education in Nigeria.

Technology is the systematic application of scientific and other organized knowledge to the solution of practical tasks (Okwudishu, 2003). The technology is said to be developed when the means or process of accomplishing a given task or solving a particular problem has advanced to such a point at which a given application of people, ideas, materials and equipment can consistently produce the expected result (Okwudishu, 2003). Technology, especially Information and Communication Technology (ICT), stimulate development. In recent years, themes such as post-industrial society, the information society, the knowledge society, and the third wave are a common theme in the discourse of how

technology impacts their social context (Tuomi, 2001 & Salajan, 2008). The information society is by so much the latest and the most progressive step in the sequence of changes that have transformed the human society since the earliest times (Zakaria, 2012). The information society is a subject of debates and discourses amongst academics and policymakers alike (Salajan, 2008).

Information Communication Technology presents both positive and negative variables on how they impact on life now and in the future and in particular teaching and learning. It has transformed how we work, communicate with each other, treat illness, eat and spend our leisure time. The pace of change shows no sign of slowing. Indeed the development of ICT and its applications to education are continuing at a faster rate than ever imagined. In a relatively short period of time, ICT skills have become fundamental to living a full life as being able to read, write and compute. Thus, unprecedented international interest in the question of how information communication technology influence a range of developmental outcomes have emerged (Nwizu, 2003). In consequence, several reviews of empirical research on the role of technology in education have appeared recently (Law, 2007; Paas, 2008; Schacter, 1999). There is a broad agreement that information communication technology plays a greater role in shaping our world today than in the past.

Technology has been instrumental in the reduction of poverty, control of endemic diseases, overcoming environmental degradation, and enhancement of the quality of life of people globally (Khondker, 2004; Law, 2007). In the area of education, ICT has a tremendous capacity to provide the best possible output in the process of education for both teachers and students this observed impact of ICT is seen to be in a painful contradiction from the standpoint of the level of ICT penetration, access and utilization in education in Nigeria.

In Nigeria, a lot of interventions by government, the private sector, and international agencies to jumpstart a technologically driven country have emerged in order to participate in this global race for technological advancement and to facilitate the development of ICT in the country. The government has adopted several ICT policies, the Ministry of Science and Technology was established by some equally relevant agencies such as National Information Technology Development Agency (NITDA) and the National Office for Technology Adaptation (NOTAP). In addition, the government has also invested in both human and infrastructural developments. Huge budgetary provisions were made in satellite acquisitions, training and development of citizens as well as encouragement of technology acquisition and infusion through a series of bilateral and multilateral agreements and treaties. It is believed that any country that neglects the importance of technology will stagnate and reverse developmental direction while other countries with rational worldwide will continue to make progress. Yet, Nigeria is not a technologically adept country. Scholars have also argued that despite multiple interventions from various stakeholders, development research community has not sorted out the relevant sustainable development strategies and the main factor leading to sustainability (Mudacumura & Haque, 2004). The question, therefore, is: what is the impact of ICT in education in Nigeria? What are the strategies for attaining sustainable development using ICT? Are there any challenges? Against this background, attainment of sustainable development in education using ICT is a fundamental need and therefore warrants a systematic and detailed examination.

The paper discusses the role of ICT in attaining sustainable development in education in Nigeria. It describes the link between ICT and sustainable development. This is significant because knowledge of the role of ICT in sustainable development would help policymakers and the public make educational plans with more certainty. The paper proffer solutions to the problem of ICT ubiquity in the Nigerian context. Finally, the challenges of sustainability.

The analysis proceeds in five main sections: first, a conceptual clarification of sustainable development, ICT, and education, section two presents policy for ICT in education in Nigeria, section three considers links between ICT in education and sustainable development; section four discusses the empirical evidence of role of ICT in attaining sustainable development, and section five concludes with the challenges and some general observations on sustainable development in education.

Sustainable Development

As dissatisfaction with the modernist, production - and income -focused conception of development associated with the 'income' concept of poverty increased (UNDP, 2010; Blake & Quirros, 2012) new approaches began to emerge from the 1980s onward ,which included the notion of "sustainable development" (United Nations, 1987) and "participatory development" (Chambers, 1997). The concept of sustainable development emerged due to lack of progress in addressing poverty in the decades after the Second World War.

Sustainable development was initially defined as development "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987). It has also come to have an associated meaning that focuses on the nature of communication and relationships surrounding development and the way in which development can be self-sustaining without ongoing external inputs (Harris, 2004). "Participatory development" and "sustainable development" in the latter sense, grew out of a recognition that knowledge is embedded within language and practices that are locally situated, and that lasting development can only be achieved through consensus, namely communication, social interaction, dialogue, and mutual understanding (Chapman & Slaymaker, 2002). Indeed, Education is seen as key in the process of achieving sustainable development. However, in order for formal education to contribute to sustainability, traditional systems and methodologies need to be re-oriented (Tilbury, Stevenson, Fien, & Schreuder, 2002; Pass, 2008). Similarly, attaining education for sustainable development can be by greater integration of ICT in teaching and learning environments (Paas, 2008).

ICT and Education

Information Communication Technologies (ICTs) are often synonymously used with New Media or New Communication Technologies (Mansell, 2012). The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2003) used the term *ICTs,* or information and communication technologies, to describe:

"…The tools and the processes to access, retrieve, store, organize, manipulate, produce, present and exchange information by electronic and other automated means. These include hardware, software and telecommunications in the forms of personal computers, scanners, digital cameras, phones, faxes, modems, CD and DVD players and recorders, digitized video, radio and TV programmes, database programmes and multimedia programmes" (UNESCO Bangkok, 2003, cited in Paas, 2008:4).

ICT is a generic name used to refer to a number of communication hardware adopted in ensuring instantaneous dissemination of information and social values across the globe. It is also a disparate set of communication technology, gadgets or equipment that have modernized, improved and eased the exchange of ideas and information of various kinds between and among people within or across distant boundaries and frontiers.

In the same vein, Nwangwu & Obi (2014) referred to ICT as the handling and processing of information (text, images, graphics, instructions, etc) for use, by means of electronic and communication devices such as computers, cameras, and telephone. Indeed, ICTs are the electronic technologies for creating, acquiring, storing, processing, communicating and using information. This involves the process whereby computers and other related machines are used in the dissemination and retrieval of information. This is a new technology from what is originally known in the traditional mass media of the print and broadcast (Sanda & Kurfi, 2013).

In Nigeria, ICT has been accepted as an element in all our lives and has a central role to play in education. ICT can transform educational practice, as an element of wider organizational transformation such as the development of mega-universities, or as a consequence of competition in international education markets (Price & Oliver, 2007). Although scholars have taken a less deterministic position, they ,however, see a link between ICT and changing educational practices such as the creation of more flexible opportunities for learning (Price & Oliver, 2007). Higgins (2012) in his studies indicated that technology-based interventions tend to produce just slightly lower levels of improvement when compared with other researched interventions and approaches (such as peer tutoring or those which provide effective feedback to learners). The impact identified in these studies indicates that what is important is not whether or not technology is used which makes the difference, but how well the technology is used to enhance teaching and learning in schools. There is no doubt that technology engages and motivates young people. Clearly, ICT is associated with changes in practice, but the nature of this association is complex and contested, not least because it forms just one influence amongst many upon academic identities (Henkel, 2000 & Taylor, 1999). In Nigeria, the debate about ICT in education centers on its penetration and utilization in teaching and learning (Okwudishu, 2002). Scholars believe that ICT provides teachers with a range of new tools to facilitate traditional pedagogies and the potential to develop new teaching methods, and for the students growing up in a culture of all-pervasive technology, ICT provides new and more exciting and relevant learning opportunities (Department of Education Service, 2008).

Link between ICT in Education and Sustainable Development

A major reason for the interest in the links between ICT and sustainable development in education is the desire of education policymakers in many jurisdictions to reduce the persistent lack of technology, lack of access and usability of ICT in the educational activity between various user groups; the administrators, teachers and the students. ICT plays a vital role in educational outcomes (Organization for Economic Co-operation & Development, 2001). The guarantee of sustainable development by the educational policy makers and planners of education system using ICT is supported by qualitative research on the impact of technology on school outcome and improvement (Price & Oliver, 2007). ICT can be used for curriculum development, research, laboratories, library information, data processing, infrastructural aid, etc (Nwizu, 2003). These benefits together with the direct capital financing it provides, suggest that technology can play an important role in promoting the sustainable national development

Empirical Evidence: The Role of ICT in Sustainable Development

ICT restructures politics, governance, economy, culture, health, education, among others, in many countries and regions around the world. ICT can be harnessed for sustainable development (Mansell, 2012). ICT provides a great development opportunity by contributing to information dissemination, providing an array of communication capabilities, increasing access to technology and knowledge among others. Individuals and groups have accepted it globally as a tool

for enhancing their varied interest. Tuomi (2001) stated that it was implicitly assumed that the effects of ICT development will trickle down to the rest of the society, changing the industrialized society into a new economy.

The major role of ICT in development, according to Blake & Quiros (2010) relates to its capacity to reducing the cost of information sharing, improving its timely availability and providing the opportunities to create systems for sharing information between people with particular interests or information needs, ICTs have the potential to contribute to the improvement of socioeconomic conditions in developing countries". Blake and Quiros (2010) provide some empirical work on the role of ICT in the attainment of sustainable development to include its role in poverty reduction. However, as pointed out by the scholars, despite proven effectiveness in helping to reduce rural poverty, priority has not been given to the development of ICTs in rural areas. Demand for ICTs is not treated with the urgency it deserves, unlike demand for primary infrastructure and social services, even when the poor demand for ICT, knowing well that information serves access to education, markets, and health services. Research indicates that impacts of ICTs on rural households include savings in time and other resources, access to better information leading to better decision making, improvements in efficiency, productivity and diversity, information on new technologies and expanded market reach (Braun, 2010). However, development in ICT for most rural areas has not been a priority due to the absence or lack of basic infrastructures.

Balanskat (2007) reviewed relevant empirical studies and identified a range of important wider benefits of ICT in learning. These include the positive impact of ICT on students' enthusiasm and skills, independent learning and collaboration with other students. Increased enthusiasm to learn leads to more attention during lessons which a teacher can use to enhance learning. Aspects for more individualized learning were described in a variety of ways. Students learn more independently according to their needs and at their own pace. They also take more responsibility for their own learning process. As seen, ICT can be beneficial to both academically strong and weak students and students with special needs. Equally, Studies reveal that these benefits can not only remain technology driven, but should be more intentional exploited following a pedagogical approach. However, collaboration or teamwork as well as the use of specific ICT's should be more strategically exploited, better planned and focused on the solving of a joint problem or given task. These skills should be sustained in the future as they present important outcomes of a new and changed educational context. Overall the evidence shows that ICT has a positive impact on attainment levels and subject related performance.

Dickson & Osaro, (2009) opined that ICT has the potentials to generate new patterns of teaching and learning in Open and Distance Learning (ODL) education programme. The use of ICT in teaching and learning is a relevant and functional way of providing education to learners in order to assist them in imbibing the required capacity for the world of work (Kosoko-Oyedeko & Tella, 2010). Indeed, Ajayi (2008) stated that with the aid of ICT, teachers can take students beyond traditional limits, ensure their adequate participation in teaching and learning process and create vital environments to experiment and explore. However, the application of ICT needs expensive hardware and software which becomes the big obligations for schools and parents. It is also necessary that both teachers and learners should have basic technology skills and knowledge to be able to apply ICT in learning. This new development is a strong indication that the era of teachers without ICT skills are gone (Nwangwu & Obi, 2014).

Research in the relationship between ICTs and educational development has now largely moved from examining if there is a causal relationship between ICT and development to trying to understand how to maximize the benefits that ICT use and adoption may provide to sustain development purposes (Brown & Grant, 2010 cited in Blake, 2010). Various approaches have emerged in trying to optimize the application of ICTs to attain sustainable development, especially with the aim of alleviating poverty. Harris (2004 sees ICTs as an ingredient to solving poverty when the potential of the information is understood as a strategic development resource that should be incorporated as a routine element into the development planning process. However, as Brown & Grant (2010) warn researchers in the academic community to be aware of the dichotomy that exists between researching ICT in developing countries and ICT for development.

The Challenges

The major challenge of ICT for sustainable development in education in Nigeria is funding. It is also a source of the current crisis facing the education sector in the rural areas worst off in this context. Most of the educational institutions in the primary, secondary and tertiary levels, including in particular rural-based schools could ,therefore, be described as operating in what could be described as an education-resource, impoverished environment characterized by limited educational resources, in the face of increasing demands for educational services. These challenges could have implications on the attainment of sustainable development in education. This problem seems to the common denominator for Africa education sectors (Dzidonu, 2010).

Closely related to the funding challenges are the issues of ICT facilities and skills which are inadequate for the sector's growth and development. Another challenge relates to the absence of policy at the ministerial level. This issue has made it difficult to coordinate ICT projects and programmers being carried out separately by various agencies operating in the education sector. This situation will lead to resource wastage and duplication.

CONCLUSIONS AND SUGGESTIONS

This article revealed the impact of ICT on education in Nigeria. However, the level of ICT use in education is still very low. This is due to a lot of factors which are institutional, as well as individual. At the institutional level, there are inadequate ICT facilities and lack of integrative ICT policy for sustainable educational development. At the level of the individual, there is the obvious lack of skills and required a capacity for using ICT either as a teacher or as a learner. These issues must be addressed to ensure a sustainable development in education.

It is recommended that to attain sustainable development in education using ICT, the level of ICT infrastructure in schools needs to be improved. Specifically, Nigeria should be working towards equipping not just all schools, but all classrooms with an appropriate level of ICT infrastructure. Attention should be given to providing all classrooms with a computer for use by the teacher, broadband internet access with adequate bandwidth, and a fixed data projector and screen, television, and electronic board for use by the teacher in presentations. Security should also be made available for such provisions.

Also, the government should develop the integrated national strategy for sustainable development in education. This strategy should involve the federal, state and local governments. This strategy should provide for full responsibility for the allocation and expenditure of resources. In doing this it might be desirable to institute a well-functioning,

horizontal interconnecting and coordination of various policy fields currently managed by different ministries, department, and agencies. This may require an inter-ministerial committee for sustainable education with a coordinating office to be called a Commission on ICT for sustainable development in education.

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