THE IMPACT OF TECHNOLOGY ON QUALITY EDUCATION IN NIGERIA: PSYCHOLOGICAL IMPLICATIONS

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Abstract: *The implication of technology across Nigeria is a well-researched area. However, various researchers have focused on a particular study area or a specific sample unit in their study; while on the other hand, studies have only looked at the impact of technology on education without taking a view on the psychological implications. This paper draws on extant literature in the domain to synthesize the psychological impacts of technology in education across various study groups within the country to build a unified framework for assessing the impact on Nigeria as a nation. Further, this seminal work draws on literature that only examines the impact of technology in education, and develops a psychological impact assessment on their results. It presents its analysis and outcomes taking into consideration the varied parameters and segregations that reflect the diverse socio-economic, cultural, religious and political landscape of Nigeria. Finally, this work aims to provide a reference for policy makers, governmental and inter-governmental organizations, and the academic community as a foundation for future studies.*

[183]

***Keywords*:** Technology, Quality Education, Psychological Implications, Impact.

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Introduction:

Technology has become a global defining factor and an indicator of national development in the 21st century. It has pervaded the entire sphere of human learning, development and achievement. Its dimension and magnitude of impact on world systems and the knowledge of society is tremendous. It has summarized the world into a global village, and promoted inter-linkages and digitalization of all fields of study. Education, which is the process of acquisition of knowledge, skills, value orientation, creativity, critical thinking, behaviour and so on by members of any society, has become interwoven with technology. Technology has provided facilitation in quality education, making learning resources not only easily accessible to learners, but as Bitter and Pierson (2005), stated it has helped in speeding up cognition and metacognition. These have boosted knowledge creation and invariably have translated into global wealth creation and [184] economic development. In Nigeria, technology in education is a welcome development. Both teachers and students are passing through technology use and digital transition in education; this is not without its challenges.

As Oyedele (2015) put it, technology is changing our notions in Nigeria we are gradually transiting to e-banking, e-shopping and so on. In recognition of the role of technology as a driving force, Nigeria took positive steps in 1988 to enact a computer education policy and introduce computer education in its schools (Adomi & Kpangban, 2010), but the implementation has not been successful. However, Olatokun and Falaranmi (2008) observed that private schools make use of ICT more than the public schools in Nigeria because they make effort to purchase the necessary facility to inculcate basic technology skills in their students, unlike the public secondary schools, who rely on government for every supply of ICT equipment. Okebukola in Ogiegbaen and Iyamu (2005),stated that 90% of the public schools in Nigeria are not ICT compliant. The population of students in public institutions in Nigeria is too significant a number to ignore.

The quality of education in Nigeria on the other hand seems to be failing increasingly. Some graduates from the Nigerian institutions of learning lack marketable skills, they are unproductive and inefficient and cannot compete with their counterparts globally. There is no synergy between classroom experiences and real life situation (Onyinye, 2017).

That implies that the quality of education is questionable and is not adequate for solving the challenges of the 21st century. The following measures should be undertaken to improve the quality of education in Nigeria. A total overhauling of the curriculum to prepare learners with skills such as ICT, leadership skills, critical thinking, decision making and problem solving skills, required in a modern era. The issue of ICT should be revisited; this will include equipping schools and institutions with digital resources, devices and tools for learning. Proper structures should be put in place for implementation, supervision, monitoring and evaluation. Efforts should be made to update knowledge in ICT use particularly for teachers who are digital immigrants. Experts should design and create web resources that are indigenous and user friendly (Adeleke, 2016).

Technology in education and its effects have been visible in the developed world for decades. Holt (2015) outlined some areas in which technology in education has improved the educational experience of learners in the United States. One major area is the integration of learners with disability into mainstream classrooms through the use of assistive technologies like hearing aids, teacher microphones and magnifying glasses. Technology in the classroom according to Holt (2015) has increased retention in learners; increase lateral thinking which allows students to solve problems more creatively, increased autonomy among students and engendered socio-emotional growth. It has also enabled students to better transfer skills learnt in the classroom into the real world. According to El Gabilan in Holt (2015)The usage of technology in instruction,

though an online language learning application for kids, interactive devices including iPad, headsets and microphones improved English language learners' fluency and accuracy from 76.6% and 83.0% to 95.30% and 91.0% respectively.

The United States Department of Education (2017) outlined the ways technology has impacted education in the United States as follows; Technology has led to personalized leaning and has given learners increased choices and the ability to direct their learning for the rest of their lives. Assessment and instruction is also tailored to meet individual differences. This has yielded better results in education, increased the motivation of learners to learn and reduced the workload of the teachers.

In Greece, Computer Assisted Instruction (CAI) has been shown to have a significant effect on Children's Cognitive, emotional linguistic and literary skills, Vernadakis, Argerinos, Tsitskari and Zachopoulou (2005). Lovari and Charalambous (2006) show that ICT can increase children's academic performance and learning outcomes. In China it has been proven that ICT can facilitate children's mental development and abstract thinking skills, (Gao, 2011). If ICT in education has yielded so many benefits in developed countries, it should no doubt yield similar and even greater benefits in Nigeria. [185]

This paper is set to draw from literature and discuss technology in education, the concept of quality education, impact of technology in education and psychological implications of the use of technology in education as well as provide some suggestions for Nigeria as a country to maximize the gains of technology in its educational system.

Concept of technology

To many, the word technology brings to mind pictures of machines, in a vague kind of way. There seem to be no universally accepted definition of technology; however, scholars have defined technology based on subjective perception. Chandra(2003) defined technology as a class of knowledge patterning to a specific product or production technique, sometimes including the technical skills necessary to use a product or a production technique. Stewart in Chandra (2003) and Funk (1999) defined technology as the sum total of skills, knowledge and procedures required for making, using and doing useful things. Hence technology connotes employing knowledge, skills and devices in doing and making things better, easier and faster. Technology has to do with economising resources, space and time and achieving maximum quality productivity in our day to day engagements.

Technology is a useful tool in life for extending the abilities of man. There are different types of technology. Ramey (2013) outlined the following types of technology: Communication Technology, Construction Technology, Assistive technology, Medical Technology, Information Technology, Entertainment Technology, Business Technology and Education technology.

Technology in education according to Ramey (2013) aims at improving performance in the classroom by creating and managing various technological processes and resources. We could thus say that technology in education involves the processes of employing information, processes, devices and knowledge within the learning situation with the purpose of increasing the gains of learning. It is the application of technology to the learning situation in order to increase productivity and improve the output. By this definition it can be said that all the means employed in the classroom to improve classroom interaction can be referred to as education technology. It is simply the application of technology to the educational process. Having examined the concept of technology, what is quality education?

Concept of quality education

Education on its own can be defined as the process of acquiring skills, knowledge, values and behaviours necessary for adaptation to the environment and for productive living. It is a process of socialization and learning. It can also be said to be a process of acculturation. Parankimali (2012) defined education as a systematic process through which a child or an adult acquires knowledge, experience, skill and sound attitude. He further stated that education makes individuals to be civilised, refined, cultured and educated. This refining and civilization of individuals can also be achieved through quality education.

Quality education refers to education that leads to the attainment of the goals of education which include self-reliance, individual productivity, ability for self-preservation and to successfully take up assigned roles and functions in the society. According to The Flemish Association for Development, Cooperation and technical Assistance (2016) Quality education provides all learners with capabilities to become economically productive, develop sustainable livelihoods, contribute to peaceful and democratic societies and enhance individual wellbeing.

Quality education must bring about economic productivity and the level of inquiry that will take Nigeria from being a one product (crude oil) economy to a diversified economy, where manufacturing will thrive. Most importantly also, quality education must breed the right values in learners and produce leaders who are not corrupt and self-centred but who have vision for the [186] country and will serve the country and her people, build infrastructure, diversify the economy and develop international collaborations for economic development.

There is an urgent need for sustainable economic, political and human development in Nigeria. Hence quality education in Nigeria must provide modalities for satisfying the need of economic growth, political growth and human capital development in order to provide quality leadership for the nation. After a review of international literature on quality in education, Barret, Chawla-Duggan, Lowe, Nikel and Ukpo (2006) outlined six indicators of quality education namely: effectiveness, efficiency, equality, relevance and sustainability. Most of these indicators are related to the role education must play in national development. Considering Equity in education implies that, a society can be said to have achieved quality education if its education meets the need of the society and is available to all and sundry.

This is a stage to which Nigeria as a nation aspires. Some private schools have achieved a high level of integration of technology in education and are at par with schools in the developed world but these schools are not affordable, hence only the rich can attend. Technology should be incorporated into both private and public schools and at all levels of education as it has been shown to yield positive results in other parts of the world, (Lovari & Charalambous, 2006; Gao, 2011; Vernadaki et al, 2005). ICT and other facilities are lacking in Nigerian schools, especially in public schools. A study carried out by Asiyai (2012), assessing school facilities in Delta state, using the stratified sampling technique to sample 640 respondents from 358 public schools, revealed that schools facilities were inadequate and available school facilities were in a state of disrepair. This situation must be addressed by the Nigerian government.

Technology in education and its impact

In the past in Nigeria, a typical classroom consisted of wooden tables and chairs. a black board, a packet of white chalk. teachers and learners. The introduction of technology in education has changed the face of the 21st century classroom into a classroom with fanciful and colourful chairs designed for comfort and functionality, white board, a packet of markers, a television set, computers and projectors, educational tablets etc. These changes are reflected in varying de-

grees depending on the type and location of the school. While this technological transformation of the classroom is clearly visible in the urban and in public schools, the traditional classroom described above is still obtainable in the suburbs and in some public schools.

There are several ways in which technology has been applied to education, leading to increased productivity in education. However, technology in education has some implications that may be negative. Technology in education also affects the psyche of learners in both positive and negative ways. Some application of technology in education include: The computer. When the computer was introduced into the school system students were preoccupied with learning how to use the computer. Computer has become a tool through which learning is achieved in the school. It is used in teaching virtually every subject, in demonstrations and in experiments. The computer is not the only technological device that has invaded the educational system. Other devices like televisions, tape recorders, DVDS, overhead projectors, interactive boards, and other audio visual devices which used to be devices used for the sole purpose of entertainment are now features in most classrooms from the pre-elementary level of learning all the way to the University and other higher institutions of learning.

In pre-primary and primary school the curriculum in specific subjects is interpreted in movies which learners can watch and grasp a hold of the targeted concepts. The direct impact of this in the learning process is that the learners' attention is focused on the subject matter for longer periods of time. Comprehension is enhanced as the medium of instruction is multimedia and multidimensional. One area of learning in which televisions and tape recorders have been very useful is in language learning especially in the learning of phonetics. Many learning aids [187] produced by native English speakers in form of videos and downloadable applications for tablets, IPhone and Android phones are available in the market. As a result of the employment of these devices in the classroom, the stress of teaching phonics is reduced. The age at which learners begin to read has been greatly reduced and the accuracy in the pronunciation of words has increased.

In the Secondary schools and higher institutions of learning, learners can carry out an experiment in the laboratory either by watching a model do same on television or by listening to tape recoded instructions etc. This method has also increased productivity as the explanations of the procedure of experimentation coupled with the videos on how to carry out experiments, enhance comprehension. Technology in this regard has also made it easier for the management of individual differences in learning. The slow learners can simply play back this recorded video over and again in other to get a grasp of the procedures. The projector and interactive boards have made it possible for illustrations to be made via a three dimensional audio visual medium which is clearly visible and audible to all members of the class room at the same time. Using a projector to deliver a lesson increases attention and focus and enhances understanding.

Kessler (2010) outlined 8 ways in which technology is improving Education as follows: Technology has made it possible for classroom learning to meet the needs of learners with different learning styles through providing: Better simulations and models, enabling global interaction among learners and encouraging cultural including language learning, providing virtual manipulates, probes and sensors which make it possible for instance of motion to be graphed in real time, efficient assessment and prompt feedbacks, Storytelling through multimedia devices, E books which are easily accessible on the net and can be transported and utilized by the learner anywhere and everywhere and Epistemic games.

West and Bleiberg (2013) outlined some ways in which technology could be useful in making the job of the teacher easier. They stated that technology has made it possible for teachers to use

applications and devices in grading students' paper work thereby easing the burden and time that would have been used in grading paper work. They also pointed out that technology has made it possible for teachers to access and utilize lesson plans from a data base, making the process of planning and delivery of lessons less time consuming and more effective.

There is also research evidence on the effect of ICT in education. Fuchs and Woessman (2004) used international data from the Programme for International Student Assessment (PISA). They show that the bivariate correlation between the availability of ICT and students' performance is strongly and significantly positive. Even though there seem to be few empirical studies on the effect of ICT in education in Nigeria, ICT in Nigeria holds great possibilities for the improvement of the educational sector. Boster in O'Hara and Pritchard (2014) reported that in a study of 2,500 sixth and eighth graders in Los Angeles, there was a statistically significant increase in Maths achievement scores when students used digital video. Sandoltz et al in O'Hara and Pritchard (2014) reported positive findings from that Apple Classrooms of tomorrow(ACOT) after about eight years of studying the effect of computer in the classroom, they found that students performed better on standardized tests, delivered lectures along with their teachers, became independent self-learners and starters, and were more self-confident. O'Hara and Pritchard in O'Hara and Pritchard (2014) found that students who learn language in multimedia or hypertext learning environments show greater gains in language development that those that learn in a traditional environment.

There is no doubt in the fact that technology has changed the way in which education is achieved the world over. Technology has redefined the face of education. It has led to the maximization of time in the classroom, increased access to reading materials, better interaction between instructors and learners, faster feedback from both learners and teachers etc. Technology has also made it possible for individuals to earn university degrees from the comfort of their [188] living rooms through virtual learning.

There is however, a downside to the increased use of technology in education and this must also be taken into perspective. Continuous starring at electronic devices by children for instance increases the risk of eye defects in children, (Hill, 2015). A research by vision council reported in Hill (2015) revealed 61% of Americans have experienced eyestrain after prolonged use of electronic devices and this can lead to permanent damage of the eyes.

Also, available on the internet are models for all kinds of behaviours both positive and negative, internet access by young learners implies exposure to negative models and also exposure to unfiltered and unverified information. It implies exposure to adult content such as pornography etc. Hence a lot of control is required on the part of parents and teachers to minimize negative effects. Social media interaction has to some extent led to the erosion of indigenous culture as more learners copy the culture of the west. Indigenous languages are also becoming more and more extinct due to increased popularity of foreign languages.

The benefits of technology in education seem to outweigh the demerits. However, learners in some public schools and schools in the suburbs are denied the benefits that technology in education provides. The government should endeavour to make technology a part of every classroom in Nigeria. Children who had not been exposed to technology from their homes will get acquainted with technology in the school making them better equipped for existence in the 21st century.

As a nation, incorporating technology in education will no doubt lead to development and advancement of the nation. In the 21st century, technology is a major driver of development. Incorporating technology into education is a major step in promoting national development. Eg-

bogah (2007) stated that technology plays a huge role in wealth creation, improvement of the quality of life of the citizens of a nation, real economic growth and transformation of a nation. Wealth creation implies poverty eradication and a reduction of the unemployment rate of the nation. These will provide a spillover effect on maternal mortality rate, universal basic education rate and gender equality; hence bringing us closer to attaining the universal development goals

Psychological implications of the use of technology in education:

The influx of modern technologies into education has brought some dynamics, which has rechanneled and re-focused the minds of children in learning, with a view to making them more skilled, functional and productive in the 21st century. In as much as technology has revolutionized teaching and learning to an extent, It has impacted much on the learning of developing children psychologically. The psychological implications of technology in education are no doubt ambivalent in nature. The positive psychological implications are enormous. The introduction of technology in education has not only enriched the learning environment of learners but has tremendously improved and changed the attitude of learners towards learning. Children that have access to computers and other forms of technology in learning have developed positive perception towards learning; because of the vast opportunity of diving into the real world, getting connected and having access to myriads of information and learning resources a click away. This also has enhanced their academic self-concept. The technological tools they use for problem solving, which is the end product of learning and the enhanced capacity and ease to translate same into real life situations, has increased their confidence and self-worth and further quest for knowledge. The discoveries of the interconnectivity of disciplines have not only increased enthusiasm in learning, but have increased cognition and meta-cognition of the learners. Technology has increased the motivation of learners particularly the use of computers, which allow the learners enough time to engage individually on the set task and this results in increased achievement (Bitter & Pierson, 2005).The variety of Information, communication and technology the learners have at their disposal promote friendliness and interpersonal relationships among learners, as they exchange knowledge in teamwork. The propensity to engage in cooperative learning is high [189] also when students are assigned to projects in groups or engage in interactive discussions. The exchange of ideas and brainstorming in such group work, facilitate their cognitive and affective growth better (Bitter & Pierson, 2005), and also results in better test scores and overall performance. Learners who are digitally aware and empowered usually operate on a higher pedestal of confidence, stability and sense of actualization because of their high level of marketability and contribution to the economy and society.

On the other hand, studies have confirmed some negative psychological implications of the use of technology in education. The world has become so digitalized, more modern and complex technologies are evolving on daily basis; shaping people's lifestyles and mode of thinking and pervading every sector. Learners who are not able to catch up with the proliferation rate of these technologies and acquaintance with their use, might begin to suffer from phobia and anxiety, manifested in some obvious physical symptoms like palpitations and sweating at the thought of being confronted with the use of technology (Osiceanu,2015). Other learners may employ an avoidance technique, by giving reasons for not using them simply because they find it difficult to use or do not have access to technology at all. This assertion is strongly supported by Okebukola in Ogiegbaen and Iyamu (2005), who confirms that over 90% of public schools in Nigeria do not integrate computer as part of classroom technology. This puts a significant majority of learners in a disadvantaged position, making them technologically inferior and limited within the global

competitive space. Some psychologists believe that over use of technology have implications for behaviour disorder. They argued that noticeable behaviour disorder in developing children such as coordination disorder, developmental delays, depression, sleep disorder, anxiety just to mention a few, are increasingly becoming a concern to mental health experts and educational institutions. Learners, who are exposed to technology early enough, have in all their lives immersed themselves into the digital world. They make use of computer games, have access to the internet, can send mails, use Facebook and able to manipulate all sorts of digital resource and soft wares. These activities, gradually impact negatively on their development. (Pavica, 2012; Rowan, 2013; Simpson, 2013). Children essentially need a lot of locomotive activities which overhaul their entire sensory system for proper development. The time devoted to technology in school and at home, constrains the children into a sedentary state for a long time and that could give rise to some of the disorders such as obesity that some media psychologists and teachers are beginning to detect among the "next generation". These behaviours, pose a management problem for the teachers (Pavica, 2012).

It is also argued that technology affects the way children think and focus. Reading naturally builds children's attentional skills and enhances their ability to focus on the material before them, while at the same time stretching their mental capacity to coordinate memory processes and other cognitive functions like critical thinking and reflection; including being imaginative and creative. With the use of technology, the young digital natives are subjected to reading E-books, with many side attractions in the internet which in effect distracts and weakens attention span, limits imaginative power and impedes memory because everything their minds were supposed to imagine, are made bare on the net. More so, their brains have been wired by technology to scan materials fast, rather than focus more intently on reading material (Taylor, 2015). Technology has created walls around individuals and limited interpersonal relationships. Since children spend much of their time on the internet, they become so engrossed in their little world and gradually severe emotional ties with parents, siblings and friends (Soltan, 2017). They become withdrawn and less sensitive to real life events. Some of these children get addicted and obsessed with the internet that they prefer to skip a meal than get detached from it. Their mood also becomes controlled by the internet. They get depressed and angry when they don't have access to any technological device. [190]

Suggestions

Technology should be incorporated into the learning environment in order to prepare learners for functionality in the 21st century and to improve the gains in education.

Nigerians should adapt online content to indigenous culture and to the specific needs of the nation.

Government should equip public schools with technological devices in order to provide every Nigerian with a level playing field for personal growth and reduce problems of inferiority complex.

Teachers who are digital illiterates should be trained, this will reduce the anxiety some teachers experience when faced with the problem of incorporating technology in the classroom.

There should be control of learners' use of certain technological devices to avoid addiction.

Learners should be educated on the right screen brightness and resolution including the need for the use of blue light blockers and night mode application in order to minimize eye defects.

More activities that promote movement play and exercise should be infused into the curriculum in order to reduce sedentary lifestyle occasioned by the use of ICT devices.

Activities such as group work, projects and excursions should be included in the curriculum to promote interpersonal relationships.
The time in which students can contact teachers on social media should be regulated to reduce stress on the teachers and increase their privacy.
Learners must be educated on the importance of preserving indigenous culture.
Research should also be carried out on the impact of technology in classrooms in Nigeria.

Conclusion

Technology in education is necessary for increased productivity and positive outcomes in learning in the 21st century. It has implications for increased access to education, for inclusion of the disabled in mainstream education, for increasing motivation of learners, for gaining and sustaining the attention of learners for easing teacher burden in various ways amongst others. It is also a veritable tool for economic development. In Nigeria there is a need to ensure that the benefits of technology in education are maximized and that it is incorporated in every school in the nation. Stake holders must however, realise the fact that the impact is ambivalent. ICT use in education holds a risk for addiction of learners, reduced interpersonal contact and skills, increased sedentary lifestyle with risk of obesity among others. There is therefore need for maximization of the benefits of technology in education and control against the detrimental effects; psychological, physical and otherwise.

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