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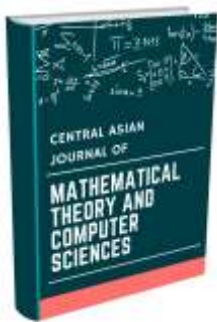
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## Integration of Emerging Technologies in Teaching And Learning Process in Nigeria: the challenges

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### ABSTRACT

The evolution of Emerging Technologies (ETs) is changing all facets of educational process ranging from; the nature of classrooms, quality of content, methodologies, mode of students' engagement, and evaluation. The integration of emerging technologies in teaching and learning process increase the interest of learners, and the quality of outcome in educational process. It brings about innovations, creativity, and flexibility to learning, thereby equipping both the educators and the learners with necessary problem solving and survival skills in a digital world. However, despite the enormous benefits of emerging technologies, its integration in teaching and learning process is often hampered by number of factors which directly or indirectly affects the integration process. The study examines the various challenges that obstruct the integration of emerging technologies in teaching and learning process in Nigeria. Data were collected through structured questionnaires, in addition to secondary data generated for review of literature. A total of two hundred (200) questionnaires were administered to respondents that consist of educators and students selected from both public and private secondary schools and tertiary institutions with similar level of infrastructures in Southwestern Nigeria. The collected data were later analyzed using descriptive statistics. The results show that majority of the respondents agrees that the integration of emerging technologies in teaching and learning process brings inspiration and modernization to education, enhance inclusiveness, and promotes the achievement of teaching and learning objectives. In addition, the findings proved that the integration of ETs in teaching learning process are often constrained by number of challenges which includes: epileptic power supply, insufficient skills, availability and accessibility issues, funding, inadequate professional development, and poor internet connectivity. The study concluded that educators at all levels of education should continue to update their knowledge and skills on how best to integrate emerging technologies in the teaching and learning process.

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### 1. INTRODUCTION

The integration of emerging technologies in teaching and learning process is no longer a choice but a need for educators considering the level of infusion of technology on education particularly as it relates to the changing learning environment, demand for flexibility in methodology, and the need to enhance creativity and innovations in learning. The application of emerging technologies has become so

irresistible in the teaching and process, and it is changing the way teaching is structured and organized, and the job performance of educators. The adoption and usage of emerging technologies assist educators and students to interact more outside the classroom, and to set up classes at any time and place. ETs do not only simplify the teaching and learning process, but also improves the quality of contents, interactions, and teaching methods. Khajeh (2011), opined that Information Technology has become a critical resource because its absence can result in lack of knowledge, poor decisions and ultimately business failure. Jawad et al.,(2014),

opined that technology has fundamental importance in every field including educational institutions, health, banking industry, Aviation, law, and security just to mention but a few. Emerging technologies such as Artificial Intelligence (AI) is changing value chains for creative content from start to finish (WEforum, 2018). Usman, Ahmad, Khurram and Bahaudin (2012), stated that Employee's performance is closely linked with technological advancement. Aliyar (2018) was of the view that technology significantly impact on the employees' performance, and that it increases employees' satisfaction and motivation. Dauda and Akingbade (2011) observed that technologies could only increase productivity or improve performance when combined effectively with other resources by human resource or when technology is effectively used. The usage of emerging technologies by educators is vital to their job performance, and the improvement of the effectiveness of teaching and learning process, visa-avis the quality of education.

The educational sector remains one of the fields with the highest influence of technology. Emerging technologies is constantly modifying the teaching and learning process thereby accommodating different kind of learners, enhancing research; improving the academic performance of students, and job performance of staff. Emerging technologies have brought several modifications to the "What", "How" "Where" and "When" of teaching and learning. It facilitates a more concrete and flexible learning approach which enhances understanding of concepts and accommodation of different kind of learners. Integration of ETs in the classroom enhances learning motivation which is critical for successful achievement of set teaching learning objectives. Also, it increases the performances of teachers in the teaching and learning process, and improves students' academic performances Dauda and Akingbade (2011) stated that organizations purchase advanced technological tools for improving the employee's performance, facilitated job tasks, improved communication, increased efficiencies, and higher levels of effectiveness in work management. Seyedeh, Shahram, and Homayounfar (2016) opined that technology can be used as a tool to help people to raise their performance and adapt with changes. Integration of ETs in teaching and learning process assists educators to adapt to the changing trends in education. Parry and Battista (2019) opined that emerging technologies help employees to update their skills to compete in the future world of work. This means that academicians and other professionals should be ready to innovate by constantly embracing emerging or cutting edge technologies in order to flourish in their careers, and to fit in into the new world of work. Nevertheless, despite the perceived positive effects of emerging technologies, its integration in the teaching and learning process are still being hindered by number of factors which the present study seeks to examine.

## 2.OBJECTIVES

The following are the objectives of the present study:

1. To identify current emerging technologies that can be integrated in teaching and learning process in Nigeria.

2. To identify the challenges that impedes the integration of Emerging technologies in teaching and learning process in Nigeria.

3. To examine ways to tackle the identified challenges in (2)

## 3. REVIEW OF RELATED WORK

Emerging Technologies play a vast role in the educational process. The application of emerging technologies in education is changing learners' experiences both inside and beyond the classrooms. Diane and Steven (2007) stated that there is an evolving relationship between education and technology, and the evolving pedagogies have also taken advantage of newly designed or emerging technologies. According to former U.S. Secretary of Education, John King, "one of the most important aspects of technology in education is its ability to level the field of opportunity for students". This is in tandem with a recent assertion by the Office of Educational Technology in U.S department of education in her 2017 National Education Technology Plan Update titled: "Reimagining the Role of Technology in Education" which stated that "technology can be a powerful tool for transforming learning, it can help affirm and advance relationships between educators and students, reinvent the approaches to learning and collaboration, shrink long-standing equity and accessibility gaps, and adapt learning experiences to meet the needs of all learners".

According to Diane and Steven (2007), ubiquitous computing is being used for education and training to provide "augmented reality" interfaces, which are characterized by the use of handheld computers to infuse the virtual world onto the real one, resulting in deeply immersive simulations. Emerging technologies has a huge impact on the human resource management in the workplace (Usman, Ahmad, Khurram and Bahaudin, 2012). Technological advancement improved the employee performance as well as less the employee working effort and task completion time (Violeth, 2015). Latest technologies, such as Artificial Intelligence and robotics, are being employed by organizations to automate simple and repetitive tasks as well as to make complex decisions quick and more accurate but it also present a number of challenges for HR professionals who will need to help employees to update their skills to compete in the future world of work (Parry and Battista, 2019). The integration of emerging technologies in teaching and learning process is capable of improving the job performances of educators, but to achieve this they need literacy of digital media.

Oliveira et al., (2019) carried out a review literature on emergent technologies from the field of science education. The study shows that emergent technological artifacts such as computer simulations, virtual labs, mobile devices, robots, games, and digital photography and drawing are increasing the experience of learners. Berland and Wilensky (2015) conducted a study on four urban middle school classrooms comparing the effectiveness of curricular units in supporting students' complex systems and computational thinking. The result shows that, students using the physical system were more likely to interpret situations from a bottom-up ("agent") perspective, and students using the virtual system were more likely to employ a top-down ("aggregate")

perspective. Edgar, Jesus and Babara (2017) conducted a study on “Emerging technologies in education: A systematic review of the literature published between 2006 and 2016”. The result shows that ET are contextual and evolving and it improves the critical thinking and problem solving skills of students.

Corinne (2018) conducted a study on “emerging technologies in higher education and the workplace: An assessment”. The study shows that digital revolution poses a double challenge to higher education: in the methods and practices of learning and of teaching. Diane and Steven (2007) in their study on “Emerging Technologies in Education and Training: Applications for the Laboratory Animal Science Community” discovered that the use of emerging technologies in animal care can create detailed training and education environments that allow students to learn the procedures more effectively, teachers to assess their progress more objectively, and researchers to gain insights into animal care. MOOCs have undoubtedly achieved some of the goals their creators had intended, such as making high-quality educational resources available to categories of people across the world who would not be able to attend similar courses in person (The Economist, 2013). Spector (2013) carried out a research on “Emerging Educational Technologies and Research Directions”. He cited the 2011 Horizon Report which states that “implications of emerging technologies for schools are ground-shaking in the sense that significant transformations need to occur if schools are to be responsive to such trends. The report further identified four critical challenges confronting ETs on education, these includes: digital media literacy, evaluation metrics, economic pressures associated with new media and proliferation of information, resources, tools and devices. Spector also stated that “enablers of successful integration of new technologies to improve learning and instruction are easily linked with barriers to success. Hemant (2018) stated that technology plays strenuous role to make teaching and learning activities more meaningful, and it is one of the most efficient tools for advancing knowledge and skills while Patrick (2018) stated that emerging technologies revolutionize the way students and teachers work and interact and try to make learning more efficient, engaging and entertaining thereby attracting both the students and the universities that enroll them. From the aforementioned, there is no doubt that there are growing literature on application of emerging technologies on education but only few exit on the challenges of integrating emerging technologies in teaching and learning process particularly in Nigeria which is the main focus of this study. The study would go a long way to bridge the gap in literature and to provide foundation for more.

**4.METHOD**

The study adopted descriptive survey research design. Data were gathered through structured questionnaires. A total of two hundred (200) questionnaires were administered to respondents that consist of educators and students selected from both public and private secondary schools and tertiary institutions with similar level of infrastructures in Southwestern Nigeria. The samples were selected through

purposive sampling technique, and the questionnaires contain questions that were relevant to the achievement of the stated objectives. The collected data were analyzed using descriptive statistics.

**The Conceptual Model of the Study**

The results of the study are summarized using the conceptual model below:

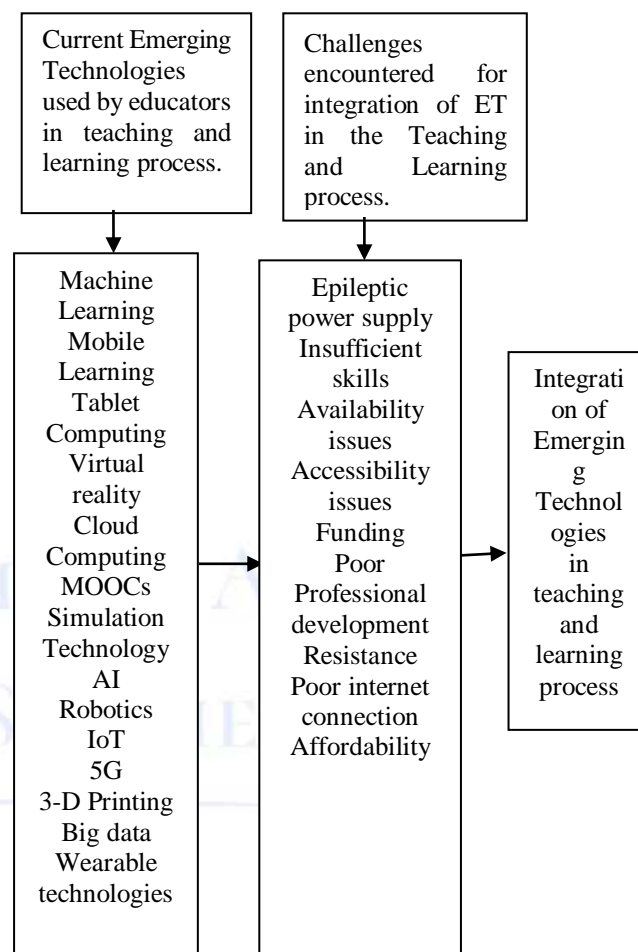


Fig.1. Conceptual Model for the study

**5.FINDINGS**

The findings of the study show that majority of the respondents agreed that the integration of emerging technologies in the teaching and learning process improves students’ learning experiences, and the level of interactivity among teachers and students in addition to the improvement in the achievement of teaching learning objectives. The result identified a number of current emerging technologies that that are being integrated in teaching and learning process. These includes: Machine Learning, Wearable technologies, Mobile Learning, Tablet Computing, Virtual Reality, Cloud Computing, MOOCs, Simulation Technology, Artificial Intelligence (AI), Robotics, IoT, 5G, 3-D Printing and Big data. All of these technologies are capable of influencing the process and outcome of teaching and learning process if properly deployed and applied. The result is consistent with an earlier assertion by Oliveira et al., (2019), that technologies have increasingly



shaped students' experiences with science as well as influenced their relationships with natural/physical world. It is also in tandem with assertion of Corinne (2018) that "emerging technologies have spawned the exponential development of software and AI-aided, cloud-based technology that aim to adapt learning methods and customize curricula to fit each student's ability to move forward at his or her own pace".

More so, the respondents expressed serious concerns about several challenges that impede the successful integration of emerging technologies in the teaching and learning process. Some of the major challenges identified includes: Epileptic power supply, Insufficient skills or expertise, Availability and Accessibility issues, Funding, Poor professional development, Resistance to change, Poor internet connections, and Affordability issues. Moreover, the findings show that these challenges are closely connected and are surmountable through combination of efforts by actors and stakeholders in education including educators, policy makers, curriculum planners, and students just to mention but a few. This conforms to the finding of Spector (2013), "that the challenges of emerging educational technologies are interrelated, and it is not possible to address just one without taking into consideration the others". Indubitably, the provision of appropriate infrastructures/facilities, trainings, funding, enabling environment, and attitudinal change are significant towards the smooth integration of emerging technologies in the teaching and learning process. Also there is need for educators to make deliberate effort towards the acquisition of digital media literacy to enhance their ability and skills to develop, and integrate relevant emerging technologies across content areas, and to fit into the modern and emerging classrooms in the 21st century, which are highly driven by technology. Teachthought (2016) opined that countless educators are making move creatively with admirable conviction towards assimilation of emerging educational technologies. Perhaps, it is important to note that many educators and students are very enthusiastic to integrate emerging technologies in the teaching and learning process despite the obvious limitations while some are reluctant.

## CONCLUSION

The study highlights the growing need to tackle the challenges that limits the smooth integration of emerging technologies in the teaching and learning process. The result affirms that the integration of emerging technologies is increasingly significant and central to the achievement of teaching learning objectives in the 21st century. From the result of the study, it is evident that emerging (learning) technologies helps to modify outdated contents and methods used in the traditional teaching and learning process which often position the teacher as master, oracle or sole disseminator of knowledge. Thus, all stakeholders in the education sector have a key role of ensuring that the identified impediments that limit the successful integration of emerging technologies in the teaching and learning process are promptly tackled to enable educators and students to maximize the potential benefits offered by emerging educational technologies.

## RECOMMENDATIONS

Based on the outcome of the study, the researcher recommends the following:

1. Educational institutions should formulate flexible policies that would encourage the integration of emerging technologies in teaching and learning process.
2. There should be a periodic training and retraining of academic staff to update their knowledge on learning technologies.
3. Educational institutions should ensure the provision of relevant infrastructures to facilitate the adoption and integration of emerging educational technologies.
4. There should be an increased budgetary allocation for educational institutions to improve their capacity to acquire, implement, upgrade and maintain emerging technologies
5. Educational institutions should establish department of Learning Technologies to enhance innovations and research on education technology.

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