Emerging Technologies and Innovative Education in Secondary Schools for Job Creation in Anambra State, Nigeria

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Abstract

The study which assessed emerging technologies and innovative education in secondary schools for job creation in Anambra State, Nigeria was guided by two research questions adopted descriptive survey research design. The population of the study consists of all the teachers in the 264 secondary schools numbering about 4,370. Cluster random sampling technique was used to select 1,504 teachers for the study. The instrument was self-designed and entitled "Emerging Technologies Innovative Education Questionnaire" (ETIEQ). The validity of the instrument was ensured. Test retest method was used to ascertain the reliability of the instrument and the scores were subjected to Pearson Moment Correlation Coefficient which gave rise to 0.79 which is adjudged reliable. Simple percentage was used for data analysis to answer the research questions. The findings revealed but not limited to: that teachers in secondary schools are not aware of some of the essential emerging technology tools. It is therefore recommended among others that the government and other relevant authorities should expedite action and begin awareness campaign by installing these facilities to schools for use to enable the recipients be job creators and self-reliant upon graduation in many entrepreneurship enterprises thus a greater Nigeria.

Keywords: Emerging technologies, Innovative education, Secondary schools, Job Creation.

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INTRODUCTION

Days are gone when the quest for a white-collar job was one of the major reasons why education was prioritized in Nigeria's polity. This is evident by the alarming increase in the level of graduate unemployment in the Nigeria which is justified in the words of Nnajiofor, Cyril, and Gowon (2020) and Gowon, Okoye, and Okorafor (2022) that Nigerian has been facing different security challenges and threats ranging from armed robbery, kidnapping, banditry, terrorism, fraud, cybercrime among others in an attempt to make ends meet. To combat these anomalies, which have troubled the entire nation, there is a need to emphasize and refocus on innovative education using emerging technologies capable of empowering self-reliance and job creation in the Nigerian educational system. Any government that desires its citizens to be creative and innovative must aspire to enhance the quality and strength of teachers (Jibril, 2020), through emerging

technologies. Emerging technologies is not only very beneficial in enhancing teaching/learning delivery process but also indispensable in practically every gamut of human endeavour (Almekhlafi & Almeqdadi, 2010; Singh, 2021; Aminullahi, 2021), like spurring creative ingenuity which translates to job creation. The imparting of job creation translates to refocusing on trade and/or entrepreneurial courses which could lead to job creation. This refocusing is basically hinged on innovation which is transference from the status quo.

Educational innovation has been unavoidably necessary owing to the dynamic nature of the society which education reflects and has resulted in the emerging technologies which promote teaching/learning effectiveness thus breeds job creation and empowerment. The new technologies in education became prominent following the invasion of the Covid-19 pandemic which ravaged so many countries and brought to an abrupt halt virtually all life activities including closure of schools. This period became the era of heightened technological application in order for life to go on hence technological advancement manifested conspicuously and exponentially. Reasoning in this direction, Khadim (2018) espoused that emerging technologies and implements have flagged a forum for control, swiftness, and universality of computer proficiency. It catapults learning experience and puts the beginner in control.

In the face of these emerging technologies and innovative education, there is absolute need to acquit the school players with the knowledge of these technologies, sufficiently and adequately supply the relevant educational resources both in quality and quantity and most importantly ensure its application in Nigerian schools. In all honesty, practical teaching of entrepreneurial courses or trade just like other courses of study requires complete awareness, and usage of the emerging technologies and satisfactory provision of educational resources which could be human and non-human. This is because even the best educator with a grandiose curriculum could produce zilch output in the absence of relevant educational facilities. This also applies to the situation whereby the facilities are available for use by incompetent teachers. In all of these, it is pertinent that emerging technological innovation be put to use in fabricating educational resources for use in schools if the issue of graduates' unemployment must be ripped from the nub failing which the evils that accompany youth unemployment will continue to hunt the entire populace.

Secondary Schools

In Nigerian educational system, there are notably four educational systems namely; (1) Early Childhood Education (Pre-primary education), (2) Basic Education (comprising primary and junior secondary school), (3) Post-Basic Education (senior secondary school), (4) Tertiary Education;

The basic education level last for 9 years duration. This makes for 6 years of primary education and 3 years of junior secondary school. It is mandatory, free and universal irrespective of gender, religious status, family background and tribal differences (Okeke, 2006). It is set to ensure all Nigerian children attend school including the 'amajiris' and street children.

The post-basic education level has 3 years duration. It is also called the senior secondary school. The junior and senior secondary are jointly referred to as the secondary schools. It is the preparatory level of education to tertiary level in

Nigerian education enterprise. For the emerging technologies to be deep rooted in the school children, there is a need to enshrine it into the secondary education curriculum for effective and efficient implementation so as to empower and instil in them the spirit of job creation from the on-set.

Emerging Technologies in Education

Prior to the emergence of technology in education, teaching/learning experiences were predominantly carried out within the four walls of the classrooms. Then it was obviously a physical teaching/learning delivery process or rather face to face contact in nature. This implies that the learners and teachers must move from one place to a point of contact which is the school and respective classes. In the event of anything distorting the movement, teaching/learning delivery is disrupted. With the advancement of technology in educational settings, teaching/learning activities took a new dimension hence it could be successfully done virtually. Education was thus brought to the door steps of the learners, accommodation and distance are no longer barriers to education. Emerging technologies have scraped totally the distance covered by school children in going to and back from school (average radius for school child) and equally reduced the stress and burden of teachers' job performance to an enviable level leading to increased productivity. Sequel to this, promotes better quality teaching and learning behaviours for empowerment and job creation.

Emerging technologies are those innovative changes that were introduced in education to facilitate goal achievement. Obviously, they are electronically driven facilities that foster teaching/learning effectiveness. In consonance with above avowals, Ukonu (2020) posited that emerging technologies are electronic devices ploughed into the educational enterprise which involves computer based classroom interactions, video conferencing, zoom e-mail and entire social media applications. To give credence to the above assertion, Digitallearning network (2019) viewed emerging technology as an overhauling of teaching/learning barriers thus making the experience more accommodating to both the teacher and the learner. It is a way of energizing teachers to create a learner-friendly atmosphere that the present generation requires. It makes education stress-free, more accessible, and quicker.

In support of the above declarations, Onyema (2019) recognized emerging technologies as synonymous with Information Computer Technology (ICT) by describing the ICT as an essential tool in teaching/learning situations which has unlocked the key of digitalizing classroom facilities. This is made possible through replacing the chalk/marker board with digital white boards which are of various forms like the use of smartphones, flipped classroom and so on. Flipped classroom is a device that enables the students to listen to the lectures at home and divert the period for classroom behaviour to other relevant exercises thus enhancing performances. Other e-learning devices are as follows: (1) tablets, these are mini computers that do not require keyboard or mouse to input data, it makes use of touch screen as input device; (2) interactive white boards, which is also referred to as smart boards, this makes it easy to show-case pictures, diagrams or any other learning materials to the students, images so projected could be moved about and/or operated according the teacher's desire to put the message across to the students; (3) e-reader, this is the kind of device that have a large compilation

of thousands of books in a converged form otherwise called digital form. It provides a wide range of reading materials and makes personal study habit; (4) gamification, this is a series of games which is intended to impart desired knowledge and skills; (5) mobile phones (Omemu, 2020) this is the type of smartphone that is widely used by the students due to its moderate price when compared to other smartphones. It is used for whatsApp, radio, television, YouTube, tweeter etc.

In line with the following expressions, that e-learning which the emerging technologies denote include but not limited to: (1) Synchronous online learning--this is an online fact to face teaching/learning process which is made possible through the use of webinars', video conferencing etc. It gives room for asking questions and getting instant answers through chats sessions and raise hand symbols. (2) Adaptive e-learning---this is a kind of e-learning that creates a scenario for the learner to be proactive because the subject matter is attuned to the needs, aims and objectives of the learner. (3) Linear e-learning---this is a kind of e-learning that involves the instructor and the learner; the learner is passive because there is no opportunity for interactive session because it is cup and jug type of learning; example is the teaching on air. (4) Interactive online learning--just as the name suggests, it is a participatory online teaching/learning behaviours which fosters progressive performance; the instructor and the learners are active during the session. (5) Collaborative online learning---this is a kind of online group discussion class which could be between students themselves or teachers and students; it calls for collective participation and sharing of ideas, skills or knowledge with an anchor man (Uwaezuoke, 2020).

Apparently, emerging technologies is an innovation ploughed into education to tackle some teaching and learning challenges both on the part of the teachers and the learners as well. It is for this reason that Eimuhi and Aiwuyo (2022) posited that emerging technologies is set out to modify teaching/learning efficacy as it is very accommodating, fosters exploration, promotes positive teaching/learning outcomes among students and enhances teachers' job performances to a desirable level. As an innovation in education, emerging technologies should start from the basement which is the secondary education so as to enable the learners master and internalize various aspects of it and exhaust all the benefits therefrom for qualitative, functional and innovative education.

Empowerment and Job Creation

To empower somebody is to equip the individual which could be in cash or kind. It is cash when physical capital is given to the individual and kind when the object of the empowerment is skills, knowledge, equipment and/or other forms of aids. An individual who is empowered tends to make a living through that means thus creating job for themselves and even to the others. In line with the above declaration, Evans et al. (2021) posited that job creation is the systematic way of gainfully employing the unemployed and under employed citizens by extensively creating new jobs for them so that those already employed do not lose their jobs. To Adegbesan and Atobjaye (2020) empowerment has to do with improvement of the individual's potentiality and abilities.

Obviously, empowerment begets job creation. It is when one is empowered that the person begins to engage in one form of occupation or another which could

lead to job creation when the job is expanded. Empowerment and job creation are both ways of gainfully employing individuals without displacing those who are already engaged. In other words, empowerment and job creation do not have to do with retrenching existing workers so as to employ new ones. It involves making fresh engagement to enable jobless individuals have a means of livelihood.

Innovative Education

Innovation and change are like Siemens twins. When there is change, innovation comes into play. Innovation is a calculated attempt in changing what used to be to a more progressive and rewarding new one that promotes accomplishment of a predetermined goal and objectives. In consonance with the above view point, Agabi (2002) succinctly submitted that innovation is an introduction of arranged positive ways of creating new knowledge, skills, thought etc. into a system that stands to foster the rate of goal attainment. Innovative education is therefore, an introduction of progressive, prearranged modifications aimed at exploring new knowledge and skills in the education industry. These alterations could be witnessed in the educational policy, implementation strategies, resources to be utilized and the objectives to be realized.

Uwaezuoke and Obiekwe (2023) laid weight on the above declaration and opined that innovative education deals with the teachers' adequate use of emerging technologies to enhance the students' mental development leading to creativity and entrepreneurial exploits. The knowledge so acquired enables them to reconnoitre, invent and discover new things. Innovative education is students' centred and spurs them into more research thereby empowering them for creativities which definitely lead to job creation. Innovative education broadens the students' horizon and motivates them to consistently search for a better way of doing things. For innovative education to be effective, there is a need for adequate provision of material resources needed. In the event of Covid-19 educational delivery process which came with digital learning devices, it is challenged first by the absence of these e-learning devices such as mobile phones and data procurement by both the teachers and students (Uwaezuoke, 2020; Debo-Saiye & Okeke, 2020). This is why Abraham (2010) chipped in that teachers are poorly remunerated and this has continued to scare intending ones to join other professions which they found more lucrative.

From the above expositions, innovation is characterized by three elements namely plan, positive and goal oriented. Innovative education is therefore a planned positive process of delving into the unknown to explore possible solutions to educational challenges. Innovative education is an instrument of empowerment among our youth. It is for this reason that Adegbesan and Atobajaye (2020) stated categorically that innovative education leads to thought provoking individuals whose brains are poised through education to make inventions that could breed empowerment cum job creation. Innovative education is by nature brain-storming.

Statement of the Problem

Change is a constant phenomenon and has found its way in educational operation through innovative education brought about by emerging technologies. This is believed to assist in empowerment and job creation for the beneficiaries if enough awareness is made in that direction, application of the technologies affected in schools and the necessary resources adequately provided. Suffice it to say that many teachers tend to be ignorant of these emerging technologies considering what transpired during the Covid-19 era. Even when some of the teachers are aware of the digital devices, they are not buoyant enough to procure them while yet others could lack the knowledge on the usage of such devices (Jibril, 2020). Some of the students are from poor socio-economic family backgrounds who could not afford the devices (Uwaezuoke, 2020). The school on its own lacks the financial capacity to adequately provide for the entire students. Students and teachers were held-bound with the closure of schools while it went viral that Nigerian schools have embraced emerging technologies. The problem of the researcher is to investigate whether teachers are aware of these emerging technologies and have applied them in teaching/learning situations in the secondary schools for empowerment and job creation on the part of the recipients.

Objectives of the Study

The objective of the study is to find out whether teachers are actually aware and have applied these emerging technologies facilities in secondary education schools in Anambra State. To be precise, the study is meant to accomplish the following objectives: (1) To ascertain teachers' awareness of emerging technologies facilities in basic and post-basic education schools; (2) To determine whether teachers have applied emerging technologies facilities teaching/learning in basic and post-basic education schools.

Research Questions

The two research questions in this study are: (1) What are the emerging technologies facilities teachers are aware of in secondary education schools?; (2) What are the emerging technologies facilities teachers have applied in teaching and learning in secondary education schools?

RESEARCH METHODS

The study employed descriptive survey research design. The population of the study consists of all the teachers in the 264 secondary schools numbering 4,370. Cluster random sampling technique was used to select 1,504 teachers for the study. The instrument was self-designed and entitled "Emerging Technologies Innovative Education Questionnaire" (ETIEQ). The instrument has two sections; A and B. Section A was used to elicit information from the respondents on the awareness of emerging technologies facilities while Section B was used to draw information on the usage of such facilities. The instrument has 15 items in each section. The response is a Yes or No type which involves tallying the number of Yes/No for all the participants to get the percentage of Yes and No for each question. 50% benchmark of the percentage score indicates the awareness/usage of the given facility while below 50% is applicable to the unawareness/non-usage of the digital devices. Face and content validity were ensured. Test retest method was used to determine the reliability of the instrument. The scores obtained were subjected to Cronbach Alpha Correlation Coefficient which gave rise to 0.79. Percentage scores were used to answer the research questions. The administration of the instrument was carried out by the researcher and five trained research assistants, out of 1004 questionnaire copies distributed, 979 were retrieved and used for data analysis.

RESEARCH RESULTS

All the collected data was analyzed to address the research questions. It is presented in respective sections corresponding to the research questions. The section titled "emerging technologies facilities teachers are aware of" pertains to the first research question, while the section titled "emerging technologies facilities have applied in teaching and learning" pertains to the second research question.

Emerging Technologies Facilities Teachers are Aware of

Teachers responded to the question: are you aware of the following emerging technologies facilities in your schools?

Table 1 showed the response of the secondary education school teachers on the emerging technologies facilities they are aware of.

Table 1.Teachers' Response on the Emerging Technologies Facilities

They are Aware of

Item Statement	Yes	%	No	%	Remark
Computer managed instruction(CMI),	56	5.72	923	94.28	No
Computer assisted instruction (CAI)	103	10.42	876	89.58	No
Adaptive-learning	97	9.91	882	90.09	No
Radio/Television	36	3.68	943	96.32	No
Linear e-learning	58	5.92	921	94.08	No
Synchronous online learning	205	20.94	774	79.06	No
The zoom app	793	81.00	186	19	Yes
WhatsApp,	881	89.99	98	10.01	Yes
Smart phones	778	79.47	201	20.53	Yes
Tablets	949	96.94	30	3.06	Yes
Smart board	Nil	Nil	979	100	No
Gamification	56	5.72	923	94.28	No
Flipped classroom	Nil	Nil	979	100	No
Web-based learning	Nil	Nil	979	100	No
Interactive online learning	759	75.53	220	22.47	Yes
Aggregate percentage	•	32.35		67.65	No

Table 1 shows the opinions of the participants on the awareness of emerging technologies facilities in secondary education in Anambra State. A critical look at the above table indicated that out of 15 items only in five items namely; 7, 8, 9, 10, and 15 that accepted being aware of the emerging technologies facilities in secondary education schools with the percentage rating scores as high as 81%, 89.99%, 79.47%, 96.94% and 75.53% respectively. On the other hand, 10 items namely: 1, 2, 3, 4, 5, 6, 11, 12, 13, and 14 rejected being aware of the emerging technologies facilities with the percentage rating scores fluctuating from 79.06%

to 100%. The aggregate percentage score for yes and no stood at 32.35% and 67.65% respectively.

Emerging Technologies Facilities Have Applied in Teaching and Learning

Teachers responded to the question: have you applied the following emerging technologies facilities in teaching/learning in secondary education schools?

Table 2 showed the response of the secondary education schools' teachers on the application of the emerging technologies facilities in teaching and learning.

Table 2.Teachers' Response on the Emerging Technologies Facilities Used in Teaching and Learning in their schools.

Item Statement	Yes	%	No	%	Remark
Computer managed instruction(CMI)	215	21.96	764	78.04	No
Computer assisted instruction (CAI)	153	15.63	826	84.37	No
Adaptive-learning	98	10.01	881	89.99	No
Radio/Television	599	61.18	380	38.82	Yes
Linear e-learning	104	10.62	875	89.38	No
Synchronous online learning	Nil	0	979	100	No
The zoom app	Nil	0	979	100	No
WhatsAap	403	14.16	576	85.84	No
Smart phone	301	30.75	678	69.25	No
Tablets	200	20.43	779	79.57	No
Smart board	Nil	0	979	100	No
Gramification	Nil	0	979	100	No
Flipped classroom	276	20.19	703	79.81	No
Web-based learning	Nil	0	979	100	No
Interactive online learning	Nil	0	979	100	No
Aggregate percentage		13.66		86.34	No

Table 2 shows the participants' response on the usage of emerging technologies facilities in secondary education schools. The table indicated that 14 out of the 15 items were not applied in the teaching/learning process in the secondary schools under study with the percentage rating scores shifting from 69.25% to 100%. The respondents however accepted having used radio/television in teaching/learning encounters with the percentage score of 61.18%. The aggregate percentage scores yielded 13.66% for yes and 86.34% for no in the usage of the emerging technological facilities in secondary schools.

DISCUSSION

The first finding of this study reveals that teachers are not aware of the emerging technologies facilities in the secondary education schools in Anambra State. In contention with this finding, Ukonu (2020) emphasized that effective use depends on the teachers' competencies and availability of the devices. This implies that for innovative education to yield its dividends to the Nigerian youth and the entire populace, teachers should not only be made to have adequate awareness of emerging technologies but should also be trained on the usage so as to achieve the aim which is geared towards empowerment and job creation. This is the reason

Adegbesan and Atobajaye (2020) posited that thought provoking which innovative educations presents and invigorates is as a result of the relevance of the emerging technologies ploughed into it. Empowerment and job creation becomes an uphill task when the teachers are not aware of the emerging technologies let alone being competent in the usage (Jibril, 2020). This is a confirmation of what Eimuhi and Aiwuyo (2022) observed when the scholars posited that emerging technologies are set out to transform teaching/learning effectiveness thereby eliminating teaching/learning difficulties which in turn propels empowerment and job creation.

The second finding of this study discovered that teachers do not apply the listed emerging technologies facilities in the teaching/learning delivery process. Teachers in Nigeria are poorly paid (Abraham, 2010; Jibril, 2020) and may not even be able to purchase these e-learning devices (smart phones, tablets etc.) even when they are aware of their existence coupled with the constant buying of data for its application with the meagre salary. Inability to use these devices could be as a result of lack of relevant knowledge and skills on how to use it as well as insufficient quantity for the students for optimum utilization (Uwaezuoke, 2020). It is for this reason that Ukonu (2020) advised that teachers need proper training before exposing them to adequate use of information communication technology (ICT). Stressing further, IIEP Learning Portal (2021) by UNESCO recognised the need for emerging technologies in imparting innovative education and was of the view that sufficient use of emerging technologies in teaching enables the teachers to empower the students intellectually which subsequently leads to job creation.

CONCLUSION

From the findings of the study, it can be concluded that the teachers are not aware of the emerging technologies and consequently have not applied them in the teaching/learning process. This is a great inhibition to the innovative education that inspires empowerment and job creation and as such a barrier to national growth and development. In this respect, the government or her appropriate agency needs to accelerate action and do the needful so as to enable basic and post-basic school children to contend headlong with the swiftness of the technological prowess eminent in the 21st century for a greater tomorrow.

Following the findings and conclusion, the under listed recommendation came into play. First, there is an urgent need for the government to speedily engage teachers on the awareness campaign on the emerging technology facilities and get them acquainted with them for constructive and functional education that begets empowerment and job creation. Secondly, the second recommendation is that the government and other educational bodies should deem it fit to procure and distribute to all schools this essential tool in the education industry and also train teachers on the usage in teaching/learning efficacy for empowerment and job creation which is the hub of innovative education.

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