

INFLUENCE OF UTILIZATION OF ICT TOOLS ON THE ACADEMIC PERFORMANCE OF STUDENTS IN PUBLIC SECONDARY SCHOOLS IN ENUGU EDUCATION ZONE, ENUGU STATE, NIGERIA

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Abstract

This study assessed influence of utilization of ICT tools on the academic performance of students in public secondary schools in Enugu Educational Zone. Two purposes of study and two corresponding research questions were used for the study. The study was carried out using a descriptive survey design. The population includes 2931 teachers in Enugu Education Zone. A sample size of 293 teachers was determined using Taro Yamane formula. The researcher made use of self-structured questionnaire titled “influence of utilization of ICT tools on the academic performance of students Questionnaire (ITASSAPAQ)”, the instrument is divided into two sections. Test-retest reliability procedure was adopted. The questionnaire was administered two times on a group of thirty students different from Enugu Education Zone, the sample of the study area at an interval of two weeks. Data collected were statically analyzed using Cronbach Alpha. This gives a reliability index of 0.75. The analysis of data was done with mean. From the findings of the study, the study revealed that zooms conferencing influenced students’ academic performance in public Secondary Schools in Enugu Education Zone and that participative Artificial intelligence to a great extent influenced students’ academic performance in public Secondary Schools in Enugu Education Zone. It was recommended that zooms conferencing should be highly initiated in schools to replace traditional classroom learning as to improve academic performance of students and that teachers should embrace Artificial intelligence in teaching and learning since it has the capacity of influencing students’ academic performance in public Secondary Schools in Enugu Education Zone.

Keywords: Utilization, academic performance, ict, zoom conferencing, artificial intelligence.

Introduction

The performance of effective teaching and learning in schools has been a subject of interest for all education stakeholders and actors in recent times. The main source of concern are the fall in the quality of the graduates of most public and private secondary schools and the shortfalls of the facilities needed for effective teaching and learning. Effective teaching is vital particularly when we consider teaching and learning as the acquisition of knowledge and skills to enable one become a more useful member of the society. Teaching involves deliberate activities and processes aimed at the development of the less matured and inexperienced mind. Teaching embraces forms of process, behaviour and activities which do not succumb to explanation by a single theory (Olorundare, 2016). Teaching therefore, is a dynamic process in education. In the classroom situation, ICT has been distinguished as indispensable tools for effective teaching and learning of computer and computer related subjects. The use of ICT in classroom situation sees the teachers as facilitator rather than dispenser of knowledge. It is therefore necessary to embrace the use of ICT in teaching and learning so as to avoid being eliminated from the global village of internet, extranet and intranet. The National Policy for Information Technology (2021) described ICT as any equipment or inter-connected system of equipment that is used in the automatic acquisition, storage, manipulation, management, control, display, switching and transmission of information. In another related concept, ICT is

conceptualized as communication in whatever forms used, accessed, relayed and transmitted to communication or send and received information (Olorundare, 2016).

In this context, ICT are tools that comprise electronic devices which are utilized for information and communication needs of institutions. Such electronic devices include computer (hard and software) networking, telephone, video, multimedia and the internet. In the classroom situation, utilization of ICT tools for teaching and learning is imperative. Nwankwudo *et al* (2016) noted that ICT provides student and teachers with practical and functional knowledge of the computer, the internet and other associated areas of ICT. Classroom teachers are expected to adequately equip themselves with professional skills in ICT. This will enable their students to perform better in classroom learning. ICT encourages active participation in classroom interaction as knowledge is shared. ICT provides more meaningful learning experiences and encourages both action and reflection on the part of the learner. It motivates and makes learning experiences clear to the students. It also accommodates differences between learners (Martey, 2023). ICT encourages students to learn independently and supports classroom settings using tools like Zoom conferencing and AI software in place of traditional classroom environment that are safe and conducive for effective teaching and learning. Mohammed (2016) noted that teachers are expected to utilize ICT facilities to inculcate relevant knowledge to students. Any classroom teacher with sufficient ICT skills will have his or her students perform better in classroom learning. The National Policy on Education states that education is an instrument for effecting national development (FRN, 2013). It makes the incorporation of ICT into teaching-learning process a vital instructional tool in fostering the national educational goals and development (Mattheos, Nattestad, Schitteck & Attström, 2021).

To buttress this, the development and role ICT plays in the academic sector is believed to set the pace for any form of innovation and changes that can ever happen to any society (Mingaine, 2023). It is believed that the winds of change in today's education sector have made information communication technology to be programmed towards meeting the set educational goals. There are challenges and concerns as a result of knowledge explosion due to the introduction of ICT in almost every field of human endeavor, which calls for an awakening in teaching profession likewise. Teachers need to be conscious of the quality of their teaching which is determined by the quality of teaching aids used such as chart, model-static, specimen and slides. As an information handling tool, ICT can be used in producing, storing, processing, distributing and exchanging of information. It therefore, implies that ICT could help teachers to be more effective in work-life and resourceful in content management (Mungai, 2022).

The Federal Ministry of Education (2020) identifies the ICT policy on education stated as follows; "The policy provides the needed guidance on what is expected in the entire process of ICT integration in education to all stakeholders in education. Its' implementation, therefore, should lead to a speedy transformation of the teaching, learning and administration of education (Martey, 2023). This in turn will foster the production of graduates in the education system that can survive in the contemporary society, sustain national development and compete globally". from Olaleye & Abiodun-Oyebanji (2020) opined that teaching tasks to become less cumbersome and productive thereby improving students' academic performance. Basically, the utilization of ICT-Driven instructional aides through CAI and other related and useful technologies is meant to serve as an orientation stimulus to support the teachers' teaching strategies and not to replace them. A paradigm shift from the traditional "chalk and talk" form of teaching to the use of ICT through modern technologies could make teaching-learning process more real and practical, thereby resulting to better performances of students academically. However, this hinges strongly on the ability and capability, as well as the effectiveness of teachers to incorporate teaching strategies such as CAI, which uses ICT Driven instructional aids in achieving the objectives of lesson at the classroom level. The benefits of ICT as an important tool in teaching and learning of wide range of topics in computer studies

Ms. Word, Spreadsheets, power point, operating system, hardware and software could enable them understand and learn the subject better. Passive learning based on the outdated form of “chalk and talk” has widely characterized the 20th century style of teaching in Africa. This in turn could pose a threat to development of a nation like Nigeria, having education as the instrument “par excellence” for effecting national development. Therefore, if Nigeria will meet up with the global technological advancement through the use of ICT, then, education must be given utmost priority and teacher education must be its guiding principle since no nation can rise above the standard of her teachers (FRN, 2013).

The Federal Ministry of Education (2020) has mandated the combination of ICT in education for speedy transformation of teaching, learning and administration of education as a positive step in the right direction. Therefore, it becomes pertinent that a study on the “Utilization of ICT in public and private Secondary Schools in Enugu State” be carried out to ascertain its impact on the learners. For ICT to enhance teaching for secondary schools, particularly in Enugu State, is through constant use of modern ICT tools by the teachers. However, the use of modern ICT components can enhance teaching and improve quality of education by making the present time teaching student centered; making the retention and accumulation of knowledge the main objective of teaching; ensuring teaching emphasizes hands-on activities where students lead discovery as well as ensure that students understand, apply and analyze facts. Hence the crux of this study was to examine the ways information and communication technology components can be integrated and used in teaching of Computer Studies in public and private secondary schools in Enugu State. The main purpose of computer education was for computer literacy and skills needed in the 21st century classrooms and outside the classroom. It goes beyond reading computer books and pamphlets. It really requires skills, abilities and competencies in the use of computer. For instance it requires digital literacy and skills, hardware literacy and skills, software literacy and skills; and computer packages integration and usage skills. Others are networking skills, programming and multimedia systems literacy and skills.

The need for the utilization of ICT resources in teaching and learning situations is on the increase. The perceived prevalence and seriousness of incompetence and poor quality of education which is the result of non-application of ICT is one of the biggest problems plaguing the school system, globalization, quest for quality education and market competitiveness has posed more challenges for ICT to become indispensable tool for public and private secondary schools in Enugu State. This study therefore is to determine the influence of utilization of ICT tools on the academic performance of public secondary schools in Enugu Education Zone.

Statement of the Problem

Secondary school education has become more complex due to change in curriculum and the need to bridge the gap between the work place and the educational society. Increase in the number of students’ enrolment as well as the number of programmes being offered is a serious concern. The poor performance of students in computer and computer related subjects is an issue that needs attention. The utilization of modern technology equipment in public and private secondary schools in Enugu State is reported that in most areas, there are ICT equipment and electricity to power the equipment, but are not effectively utilized while in other areas, there are paucity of ICT equipment which are often underutilized by the users. The information technological age offers ICT instructional strategies to improve the manual usage in teaching and learning and school administration. Innovative use of ICT in the administration process in most secondary schools in Enugu State seems not to be widespread. This appears to be made difficult by several constraints which include lack of funds to sustain ICT Infrastructure, the inability of secondary school administrators to keep up with the pace of development in ICT, the lack of the staff with appropriate skills to manage ICT both at the

strategic and operational levels, epileptic electricity supply or complete absence of it in schools affects institutional policies to support and guide the use of ICT. The low level of internet usage, inadequate computers and its accessories, and lack of internet access, point result to a poor attitude towards the use of internet. The low level of application of ICT in secondary school system pose a serious threat to the ability of the school administrator to handle large volume of information at a fast rate and it also posed a threat to other policies implementation within the educational sector. Technophobia among the teachers is also an issue that militate against the penetration of this technology in our secondary schools. These identified problems therefore provoked the researcher to conduct this research on the influence of Utilization of ICT tools on the academic performance of students in Public Secondary Schools in Enugu Education Zone.

Purpose of the Study

The main objective of the study was to determine the influence of utilization of ICT tools on the academic performance of students in public secondary schools in Enugu Education Zone. Specifically, the study sought to determine:

1. influence of Zoom conferencing on students' academic performance in public Secondary Schools in Enugu Education Zone.
2. influence of Artificial intelligence on students' academic performance in public Secondary Schools in Enugu Education Zone.

Research Questions

The following research questions were developed to guide the study.

1. What is the influence of Zoom conferencing on students' academic performance in public Secondary Schools in Enugu Education Zone?
2. What is the influence of Artificial intelligence on students' academic performance in public Secondary Schools in Enugu Education Zone?

Methods

The design of the study was a descriptive survey which aims at collecting data specifically on the opinions, attitudes and views of the subjects on a particular issue as general ways of sustaining interest of students in learning. The area of this study was Enugu Education Zone. Enugu Education Zone comprises, three local government areas (Enugu North, Enugu East and Isi-Uzo Local Government Areas) in Enugu State. The headquarters is Enugu North which was built by Hon Sylva. The population for the study comprised of 2931 male and female senior secondary school teachers from the thirty-one (31) secondary schools in Enugu Education Zone. The sample size for the study was 293 male and female senior secondary school teachers from five out of 31 public secondary schools in the area. The researcher made use of self-structured questionnaire titled "influence of utilization of ICT tools on the academic performance of students Questionnaire (IUICTTASQ), The instrument was divided into two sections. Section A is for the respondent's personal data like name of school while section B is for Utilization of ICT tools. All together, a total of 10 item statements were generated and placed on four-point scale of strongly agree (SA), Agree (A), disagree (D) and strongly disagree (SD). The validity of the questionnaire was done using three experts, two from the Department of Educational Management and one from the Department of Mathematics and Computer Science Education and specialized in Measurement and Evaluation all from the Faculty of Education, Enugu State University of Science and Technology, Enugu State. Test-retest reliability procedure was adopted. The questionnaire was administered two times on a group of thirty students different from Enugu Education Zone, the sample of the study area at an interval of two weeks. Data collected were statically analyzed using Cronbach Alpha. This gives a reliability index of 0.75. Questionnaire were personally administered to the respondents with the help of three research

assistants who are form teachers in the sampled schools and classes and collected back from them on the spot. The instrument was administered during the students' break hours as agreed with their form teachers in order not to disrupt the normal classroom lessons. The analysis of data was done with mean. This is because mean is generally regarded as a good measure of central tendency. The responses of the respondents were scored based on the points assigned to each response which include: Strongly agree-4 points; Agree-3 points; Disagree-2 points and strongly disagree-1 point. The decision rule was that mean responses of 2.50 and above signifies agreeing to the item statement highlighted while mean responses below 2.50 signifies disagreeing to the item statements highlighted.

Results

Research Question 1: What is the influence of Zoom conferencing on students' academic performance in public Secondary Schools in Enugu Education Zone?

Table 1: Mean scores and SD on the influence of Zoom conferencing on students' academic performance in public Secondary Schools in Enugu Education Zone

N=293				
S/N	Zone influence students performance in the following ways:	Mean	SD	Remarks
1	Zoom increases student engagement.	3.59	.71	VGE
2	Zoom provides an alternative outlet for students to learn.	3.15	.97	GE
3	This flexibility can be particularly beneficial for students who may struggle with traditional classroom environments.	3.32	.63	GE
4	Using Zoom's features, such as chat and quizzes, can enhance student participation and learning outcomes.	3.04	.93	GE
5	Many students have a positive perception of online learning through Zoom.	2.91	.79	GE
6	Zoom allows students to attend classes remotely.	3.28	.80	GE
7	Zoom can facilitate personalized learning experiences.	2.59	.78	GE
8	Zoom's features, such as breakout rooms and screen sharing, can facilitate collaboration among students.	3.04	.71	GE
9	Zoom can provide students with access to experts and resources beyond their local community.	2.86	.82	GE
10	Zoom can help reduce absenteeism.	2.51	.83	GE
11	Zoom can help students develop better time management skills.	3.37	.64	GE
Weighted Average		3.06		GE

Key: SD = Standard Deviation, VGE = Very Great Extent, GE =\Great Extent, LE = Low Extent, VLE = Very Low Extent.

Table 1 shows that item no 1 has mean range of 3.50 – 4.00 with decision of very great extent perception, this indicate that the respondents perceived the influence Zoom conferencing on students' academic performance in public Secondary Schools in Enugu Education Zone, items 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11 have mean range of 2.50 – 3.49, this indicated that the respondents perceived that directive decision making strategies to a great extent influence of Zoom conferencing on students' academic performance in public Secondary Schools in Enugu Education Zone. Generally, the weighted average/ grand mean of the items is 3.06, indicating Great Extent perception that influence Zoom conferencing on students' academic performance

in public Secondary Schools in Enugu Education Zone. The Standard deviations (SD) of all the items are within the range of 0.63 to 0.97 and are positive which indicates that the respondents were not very far from one another in their responses. This implies that to a great extent directive decision making strategies influence Zoom conferencing on students' academic performance in public Secondary Schools in Enugu Education Zone.

Research Question 2: What is the influence of Artificial intelligence on students' academic performance in public Secondary Schools in Enugu Education Zone?

Table 2: Mean scores and SD on the influence of Artificial intelligence on students' academic performance in public Secondary Schools in Enugu Education Zone.

					N=293	
S/N	Artificial intelligence influences students' academic performance the following ways:	Mean	SD	Remarks		
12	AI-powered platforms provide customized learning experiences	2.82	.77	GE		
13	AI tools like speech recognition and text-to-speech software enhance accessibility and diversity in education.	3.10	.85	GE		
14	AI can grade assignments and exams quickly and providing nuanced feedback.	3.24	.73	GE		
15	AI-driven personalized tutoring improves academic performance by deepening engagement	3.10	.67	GE		
16	AI-powered systems can identify learning gaps and provide targeted interventions.	3.06	.83	GE		
17	AI can help teachers assess student performance more accurately, providing insights into areas where students need improvement.	3.01	.95	GE		
18	AI-powered systems provide personalized feedback to students.	3.10	.73	GE		
19	AI automate administrative tasks, freeing up teachers to focus on teaching and student support.	3.36	.64	GE		
20	AI-powered tools make learning more engaging and interactive.	3.32	.70	GE		
21	AI can provide real-time feedback to students, helping them track their progress and identify areas for improvement.	2.88	.86	GE		
22	AI can analyze large amounts of data to provide insights into student learning patterns.	2.61	.88	GE		
23	AI-powered provide students with a more immersive and interactive learning experience.	2.70	1.25	GE		
24	Teachers may need additional support and training to effectively integrate AI-powered tools into their teaching practices.	2.25	.89	LE		
25	AI-powered systems may collect sensitive student data, raising concerns about data privacy and security.	3.00	.67	GE		
WEIGHTED AVERAGE		2.97		GE		

Key: SD = Standard Deviation, VGE = Very Great Extent, GE = Great Extent, LE = Low Extent, VLE = Very Low Extent

Table 2 shows that item no 24 has mean range of 1.50 – 2.49 with decision of low extent.. On the other hand, items 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 25 have mean range of 2.50- 3.49, this indicated that the respondents perceived the items raised as great extent. Generally, the weighted average/ grand mean of the items is 2.97, indicating Great Extent. The Standard deviation values (at the range of 0.64 to 1.25) were small indicating that the respondents' responses are closely clustered around the mean, signifying that their responses are homogenous. This implies that artificial intelligence have influence on students' academic performance in public Secondary Schools in Enugu Education Zone.

Discussion

The findings also revealed that Zoom can increase student engagement, especially for those who are hesitant to participate in traditional classroom settings. This can lead to better academic performance and confidence. Similarly, zoom provides an alternative outlet for students to learn, allowing them to access educational content from anywhere, this flexibility can be particularly beneficial for students who may struggle with traditional classroom environments and that zoom can help students develop better time management skills, as they can attend classes from anywhere and at any time, as long as they have a stable internet connection. These findings are not in consonance with Nwankwudo (2016) who noted that ICT provides student and teachers with practical and functional knowledge of the computer, the internet and other associated areas of ICT.

The findings revealed that to a great extent artificial intelligence influenced students academic performance. The findings equally revealed that AI-powered platforms provide customized learning experiences tailored to individual students' pace, helping them understand complex concepts more efficiently, AI tools like speech recognition and text-to-speech software enhance accessibility and diversity in education, benefiting students with disabilities, AI can grade assignments and exams quickly, freeing teachers to focus on lesson planning and providing nuanced feedback and that AI-powered virtual learning environments can provide students with a more immersive and interactive learning experience. This finding is in line with Nwankwudo (2016) who noted that ICT provides student and teachers with practical and functional knowledge of the computer, the internet and other associated areas of ICT.

Conclusion

Based on the findings of this study, it can be inferred that secondary school students academic performance in Enugu State were highly influenced by ICT tools and facilities for effective teaching and learning. A teacher in the state public secondary schools sees the use of zoom conferencing and AI as highly influential ICT facilities that can boost students' academic performance in Enugu Education Zone, Enugu State.

Recommendations

Based on the findings, the following recommendations were made:

1. Zooms conferencing should be highly initiated in schools to replace traditional classroom learning as to improve academic performance of students.
2. Teachers should embrace Artificial intelligence in teaching and learning since it has the capacity of influencing students' academic performance in public Secondary Schools in Enugu Education Zone.

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