

Influence of Information and Communication Technology on Academic Performance of Secondary School Students in Enugu Education Zone of Enugu State

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Abstract

The research investigated the influence of Information and Communication Technology on Academic Performance of Secondary School Students in Enugu Education Zone of Enugu State. To direct the investigation, three distinct objectives and three related research questions were posed. A structured questionnaire was the tool utilized to gather data. Mean statistics and standard deviation were employed to assess the gathered data. Three hundred students from secondary schools in the Enugu Education Zone made up the study's population. Three hundred students were chosen at random from a total of 156,800 secondary school students in the Enugu State Education zone and sampled using the simple random sampling approach of balloting without replacement. Three experts: two from the Directorate of Professional Diploma in Education and one from the Department of Computer Education validated the instrument. Test-retest reliability was established, and Cronbach Alpha was used to correlate scores. Reliability Co-efficient of 0.89 was attained. The results showed that secondary school students in Enugu Education Zone performed better academically when using the internet, computer-aided education, and Zoom as instructional aids. Based on the Findings, the study recommended based on guidelines set forth by the National Policy on Education, the government should purchase the ICT infrastructure that schools require. By doing this, teachers and students will be capable to fully utilize the continual advancement in technology and the contribution of ICT to education.

Keywords: Information, communication, Tecnology, and academic performance

Introduction

Information and communication technology plays a vital part in creating the new global economy, delivering rapid societal transformation. In recent times, the trend of information and communication technology is taking the center stage around the globe. ICT is generally accepted as a modern tool that makes learning easier and more enjoyable, it also enables educators to modify the teaching method used to increase interest of students (Najeem, 2023) Technology related to information and communication encompasses any gadget that can electronically store, retrieve, modify, send, or receive data in a digital format. The World Bank (2002) states that through

ICT, information (speech, data, texts, and images) can be collected, stored, processed, transmitted, and presented via hardware, software, networks, and media. These encompass a range of technologies designed to perform information processing and communication tasks, including desktop and laptop computers, internet access, computer gaming consoles, DVD players and recorders, peripherals, and internet connections. According to Schrand (2018), Information and communication technology appeals to a variety of intelligences and learning styles, promoting more active learning in the classroom. ICT is an extremely potent learning environment that changes how

knowledge is taught and learned, enabling students to engage with information in an engaged, independent, and productive manner. According to White (2019), Infrastructure availability, teacher adoption and embrace of ICT in the classroom, and the general acceptance of the technology's benefits are all critical factors in the effective integration of ICT in teaching and learning.

Without a doubt, ICT helps students to acquire knowledge more quickly, retain it longer, get more precise information, and comprehend delicate ideas (Lawal, 2020). It also provides them with the opportunities to study at their own convenience. Odofin, 2021 opined that the essence and fluency of speech are enhanced when students actively engage in a variety of computer and the Internet activities, such as playing games, viewing movies, and engaging in online chats. Additionally, students actively use computers and other relevant technology for school-related tasks. Some examples of these chores include downloading course materials from school websites, surfing the Internet for information, and using specific applications to enhance their learning strategies and efficacy (Delen & Bulut, 2011). Students are also exposed to the use of technological tools in learning activities which include the use of the Google Classroom, Zoom, YouTube and other e-learning programmes. ICT use in the classroom can boost motivation, enhance memory retention, and generally expand comprehension (Dede, 2016). Abdulrahman (2020) postulated that Through the use of ICT, educators may enable students to go beyond conventional boundaries, guarantee their full engagement in the process of teaching and learning, and establish vital spaces for experimentation and exploration. But using ICT effectively necessitates expensive hardware and software, which makes it a challenging chore for parents and schools. Before using ICT, it is also crucial for teachers and students to have a basic understanding

of technology. This presents a significant obstacle for secondary school student. Grimus (2016) provided support for this claim, arguing that through imparting ICT skills in schools, pupils are better equipped to deal with future advances through comprehension. Additionally, IT can be utilized to enhance group problem-solving exercises, role-playing, and well-articulated projects that foster collaborative learning. be us (Odofin, 2021). ICT makes it possible for people to connect and form rich networks of relationships. According to some writers, technology has the ability to alter how student learn. (Kozma, 2017) Students can take use of the chance that information and communication technology offers educational institutions to utilize these technologies to unlock students' potential and talents Titus, Justina. & Sylvester (2020), it also gives both teacher and learner opportunities to learn how to operate better the new technology and understand better the efficacy of the modern trend. However, the effectiveness of ICT in teaching especially in developing countries like Nigeria has so many factors that are militating against its use, these include limited ICT gadgets available in schools, poor internet connection, lack of electricity, lack of skills on the part of teachers which affect the quality of their output and these in turn affect the performance of the students (Adelakun, 2013) On this note the researcher deemed it necessary to investigate the influence of information and communication technology (ICT) on secondary school students' academic performance in Enugu Education zone in Enugu State and through the recommendation prescribe solutions to these problems.

Statement of the Problem

Numerous scholars and theorists contend that computer use can increase students' knowledge, decrease the amount of direct instruction they get, and allow teachers to assist kids with specific needs.

Additionally, the usage of ICT gives students the chance to engage with peers both inside and outside of the formal system and to understand the fundamentals of learning.

Despite all this ICT benefits the secondary student performance in both internal and external examinations are still at a very low performance level. This is attributed by lack of sufficient application of ICT tools in the secondary schools' academic activities, school authorities have very lukewarm attitude over provision of this needed tools which invariably affects their performance. For instance, the success rate of public secondary school students in WEAC 2016 was 60.1% percent, it increased to 72.5% percent in 2017 and in 2018 it declined to 61.6% then in 2019 it rose to 65.8% percent. In 2020 it increased to 76.3% percent and in 2021 it was 93.9% percent (National Bureau of Statistic, 2021). Also in UTME the percentage of students that scored 160 and above in 2018 was 25.09 percent, in 2019 it increased to 27.00 percent. In 2020 the student performance decreased to 24.09 percent which later increased to 60.62 percent in 2021. The trend shows that there is immense need to increase the use of ICT in secondary school because most of the internal and external examinations make use of computers in writing the examination (Computer Based Test) and students perform poorly because they are not acquainted with the system.

On this note, this study tends to investigate the influence of information and communication technology on secondary schools' student academic performance in Enugu academic zone Enugu State.

Purpose of the Study

The aim of this study is to investigate the influence of information and communication technology on the academic performance of secondary school students in Enugu Education Zone, Enugu State. The specific purposes of the study sought to determine:

1. The rate at which internet influences the performance of secondary school student academically in Enugu Education Zone of Enugu State.
2. Influences of computer aided instruction on performance of secondary school students academically in Enugu Education Zone, Enugu State.
3. Influences of Zoom as instructional tool on performance of secondary school students academically in Enugu Education Zone of Enugu State.

Research Questions

The study was guided by following research questions:

1. What are the rate at which internet influences the performance of secondary school students academically in Enugu Education Zone?
2. What are the influences of computer aided instruction on the performance of secondary school students academically in Enugu Education Zone of Enugu State?
3. What are the influences of Zoom as instructional tools on the performance of secondary school students academically in Enugu Education Zone of Enugu State?

Methodology

The study utilized descriptive research design for its investigation. It is a survey design according to Sambo (2015) in which group of individuals or items are investigated by collecting and evaluating data from a small number of individuals or items stands as a representative of the total group. The design was seen to be the best fit for the study because it allows for the use of a questionnaire to find out what people in the investigation region think.

The investigation was carried out in government secondary schools in Enugu Education Zone. The selection of this region of investigation by the researcher was due to geographical and educational

development. Enugu Education Zone is made up of three Local Government Area namely Isi- Uzo, Enugu North, and Enugu East LGAs. The study's population comprised one hundred and fifty-six thousand, eight hundred 156,800 secondary school students in Enugu Education zone (PPSMB, 2022).

The study's sample size consist of 300 secondary school students from the twelve sampled secondary schools in Enugu State Educational Zone. Simple random sampling technique with no replacement was used to determine the sample size. It was carried out using unbiased selection of selected schools in the area. The Taro Yamani statistical formula was used to calculate the sample size.

A structured questionnaire was the tool utilized in data collection. The survey questionnaire was constructed based on the research questions that guided this research and it consisted of eighteen (18) items from which the opinions of the respondents were sought. The responses were according to a modified four-point like scale of Strongly Agreed (SA), Agreed, Disagreed (D) and Strongly Disagreed (SD). This instrument was validated by three professionals, one from Department of Computer Education and two from Directorate of Professional Diploma in Education. The professionals gave the instrument a thorough inspection and adjusted it as needed. The researcher finally modified the instrument by incorporating the expert suggestions and adjustments. The researcher used test-

retest method to determine the reliability of the instrument. Twenty (20) copies of the survey questionnaire were first administered to students in from Department of Computer Education and Educational Foundation (Measurement and Evaluation). This was repeated after two weeks interval. The scores were correlated using Cronbach Alpha. 0.89 was obtained as a degree of stability of test which proved that the instrument was reliable. Three hundred copies of questionnaire were administered through direct visit to schools by the researcher. The copies of questionnaire were collected from the respondents after they have been filled on the spot, making a total collection rate at 100%.

The questionnaire items employed to collect data for this study were made up of four (4) options with nominal values assigned to them. The options and nominal value attached to each option are: Strongly Agree = 4, Agree = 3, Disagree = 2, and Strongly Disagree = 1. The researcher employed SPSS analytical in conducting the analysis. Based on this result, any questionnaire item with mean score greater or equal to 2.50 was viewed as Agree (A) while any questionnaire item with mean score less than 2.50 was viewed as Disagree (D).

Research Question 1

What are the influences of internet on performance of secondary school students academically in Enugu Education Zone of Enugu State?

Table 1: Mean response on the influences of internet on performance of secondary school students academically in Enugu Education Zone

S/N	Influences of internet on performance of secondary school students academically	N	Mean	Std.	Decision
1	Internet aids students in getting information easily	300	3.56	.68	Agree
2	Internet provides opportunities for students to share ideas and communicate with their counterparts	300	3.42	.64	Agree

3	Computer aided instruction creates room for student to practically perform what is being taught	300	3.11	.91	Agree
4	Computer aided instruction facilitates students acquisition of basic skills	300	2.96	.92	Agree
5	Computer aided instruction enables students to study at their convenient time	300	3.42	.59	Agree
GRAND TOTAL			3.29	.75	Agree

In Table 1, the results of the data analysis showed that all questionnaire items had mean rating above the bench mark of 2.5 as follows 3.56, 3.32, 3.42, 3.61 and 3.45 from items 1-5 respectively. This implies that the respondents agreed that internet influence the performances of secondary school students academically in Enugu Educational Zone. The results indicated that internet aids students in searching for information easily, increases students' motivation and encouragement and also facilitates students' acquisition of basic skills which in turn improves their academic performance. The grand mean of 3.37 was greater than the bench mark of

2.50. The grand standard deviation is neither lower nor higher than the item standard deviation therefore, there is homogeneous variability among the data set, indicating that each scores item is uniformly spread. This implies that the respondents agreed that internet positively influences secondary school student performances academically in Enugu Education Zone.

Research Question 2

What are the influences of computer aided instruction on performance of secondary school students academically in Enugu Education Zone of Enugu State?

Table 2: Mean response on the influences of computer aided instruction on performance of secondary school students academically in Enugu Education Zone of Enugu State.

S/N	Influences of computer aided instruction on performance of secondary school students academically	N	Mean	Std	Dec.
6	The use of internet aids students to search for information easily	300	3.56	.68	Agree
7	Computer aided instruction facilitates students acquisition of basic skills	300	2.96	.92	Agree
8	The use of computer aided instruction breaks heavy dependency on teacher as the primary knowledge source	300	2.72	1.16	Agree
9	Computer aided instruction enables students to study at their convenient time	300	3.42	.59	Agree
10	Computer aided instruction encourages student-centered lesson delivery approach	300	3.22	.79	Agree
11	Computer aided instruction motivates students to study as those negative hindrances from the teacher such as fear and so on are eliminated	300	2.89	.98	Agree
12	Constant use of computer as instruction material aids in increasing the speed at which the students operate the technology which helps them in writing computer-based examinations.	300	3.51	.53	Agree
GRAND TOTAL			3.18	.81	Agree

In Table 2, the results from data analysis indicated that all questionnaire items had mean rating above the bench mark of 2.5 as follows 3.56, 2.96, 2.72, 3.42, 3.22, 2.89 and 3.51 from items 6-12 respectively. This implies that the

respondents agreed that computer aided instruction influences performance of secondary school students academically in Enugu Education Zone. The results indicated that Computer aided instruction motivates students to study as those

negative hindrances from the teacher are eliminated and also it gives them the opportunity to study at their convenient time and pace. The grand mean of 3.1857 was greater than the bench mark of 2.50. The grand standard deviation is not lower nor higher than the item standard deviation therefore, there is no dominant item score. This implies that the respondents agreed that computer aided instruction has a

positive influence on academic performance of secondary school students in Enugu Educational Zone.

Research Question 3

What are the influences of Zoom as instructional tools on performance of secondary school students academically in Enugu Education Zone of Enugu State?

Table 3: Mean responses on the influences of Zoom as instructional tools on performance of secondary school students academically in Enugu Education Zone of Enugu State

S/N	Influences of Zoom as instructional tools on performance of secondary school students academically in Enugu	N	Mean	Std	Dec.
13	Teachers make use of zoom in delivering their lessons efficiently to the students advantage	300	3.21	.94	Agree
14	Teaching and learning with zoom are interesting	300	3.20	.93	Agree
15	Student submit their assignments through zoom	300	2.76	.97	Agree
16	With the use of zoom students are disciplined in time keeping	300	3.53	.55	Agree
17	Zoom remove distant barrier among students	300	3.54	.55	Agree
18	Zoom has the capacity for recording lessons	300	2.52	.83	Agree
GRAND TOTAL			3.13	0.80	Agree

In Table 3, the results of the data analysis showed that all questionnaire items had mean rating above the bench mark of 2.5 as follows 3.21, 3.20, 2.76, 3.5300, 3.54 and 2.52 from items 13-18 respectively. This implies that the respondents agreed that Zoom as instructional tools influences the performance of secondary school students academically in Enugu Education Zone of Enugu State. The results indicated that zoom provides opportunity for teachers to deliver their lessons efficiently to the students' advantage. It also helps in disciplining students in terms of time management. The grand mean of 3.13 was greater than the bench mark of 2.50 The grand standard deviation is neither lower nor higher than the item standard deviation therefore, the scores item is uniformly spread. This implies that the respondents agreed that Zoom have positive influence

on performance of secondary school students academically in Enugu Education Zone.

Discussion of the Findings

In Table 1 above, the researcher presented the data analysis on influences of internet on performance of secondary school students academically in Enugu Educational Zone of Enugu. The respondents all agreed to Items 1 – 5 with mean score above 2.5 bench mark. Specifically, the respondents agreed that internet aids students in searching for information easily, increases students' motivation and encouragement and also facilitates students' acquisition of basic skills. These in turn improve the academic performance of the students. The finding is in line with Kumar and Kaur (2006) who stated in their study that internet makes students to adopt modern ways of finding

solutions to problems. The results corroborated the sensory stimulation theory, which holds that stimulating several senses leads to increased learning and enhances a student's performance academically. It also lent credence to Agil and Ahmad (2022) who asserted that internet has provided opportunity for the learner to use maximum senses to get the information.

In Table 2, the researcher presented the data analysis on influences of computer aided instruction on performance of secondary school students academically in Enugu Education Zone of Enugu State. All the respondents agreed to Items 6-12 with mean score above 2.5 bench mark. Thus the result indicates that computer aided instruction motivates students to study as some negative hindrances from the teacher are eliminated and it also students practice what is being taught immediately inside the classroom which helps in the retention of the lesson. This affirmed the findings of Adomi (2022) who opined that computer aided instruction makes students to be alert in the classroom as they would like to perform the task the way the teacher did it. Also Arinze, Okonkwo and Iwunor (2019) noted the use of computer as instruction material improves speed at which students operates the technology which helps them in writing computer-based examination. Titus, Justina and Sylvester (2020) admitted the use of computer in the learning process brakes barrier between teacher and learner and as such helps student in building confidence.

Finally, in Table 3, the researcher presented the data analysis on influences of Zoom as instructional tools on performance of secondary school students academically in Enugu Education Zone of Enugu State. The respondents agreed on the questionnaire items 13-18 whose means scores are above 2.5 bench mark. This implies that zoom provide opportunity for teachers to deliver their lessons efficiently to the students advantage it also helps in disciplining

students in terms of time management. This is in line with Ray (2020) who attested in their study that Zoom is valuable tool that improve teaching and learning which fosters collaboration, can assess students' written works and performance output easily. Also it can provide clear guidance for doing their best work, improve learners' teamwork, increase competence, save expenses and lessen environmental impact without sacrificing privacy or security.

Educational Implication of the Findings

Findings from this study showed that internet has a positive influence on the performance of students in secondary school academically in Enugu Education Zone, Enugu State. This implies that internet has a positive effect in improving performance of students academically both in internal and external examinations.

Also, the result showed that computer aided instruction has a positive influence on performance of secondary school students academically in Enugu Education Zone of Enugu State. This implies that the use of computer aided instruction impacts positively in improving the performance of student academically.

Lastly, the findings of the study show that Zoom as instructional tools influences has a positive influence on performance of secondary school students academically in Enugu Education Zone of Enugu State, indicating that zoom has positive effect in improving academic the performance of secondary student.

Summary of the study

This study investigated the influence of information and communication on secondary school students' academic performance in Enugu State Educational Zone. Three research questions was employed as guide for the study. Descriptive survey design was employed for the study. Three hundred secondary school students were used as sample for the study and it was sampled using simple random sampling technique of balloting without replacement from twelve selected

secondary schools in Enugu State Education Zone. Data were analyzed using mean. The result revealed that internet, computer aided instruction and Zoom as instructional tools have positive influence on performance of secondary school students academically in Enugu Education Zone of Enugu.

Conclusion

The researcher found out that the Incorporation of ICT is very essential in teaching and learning in secondary schools as it enhances the performance of students academically both in external and internal examinations. ICT motivates and encourages student to learn and provides avenue for student search for information easily. In conclusion, all educational levels should use ICT in their teaching and learning processes in Nigeria as its advantages are so alarming.

Recommendations

The following recommendations based on the research findings:

1. Following the guidelines set forth by the National Policy on Education, the government should purchase the ICT infrastructure that schools require. By doing this,

teachers and students will be able to utilize all opportunities of the continual advancements in technology and the contribution of ICT to education.

2. The development and usage of software and multimedia computers that are pertinent to education should be encouraged among teachers. This can be accomplished by offering a soft loan for the purchase of a personal computer or by having government supplies available at a discounted rate.
3. Secondary school administration should start a program for widespread computer literacy especially for all secondary school teachers at various levels. This should be achieved through in-service training, workshops, seminars and conferences in order to maximize the advantages of ICT in the classroom. Lastly, digital libraries should be made available to government schools in order to improve ICT-based learning

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