NIGERIAN SENIOR SECONDARY SCHOOL STUDENTS' ENGAGEMENTS OF DIGITAL TECHNOLOGIES FOR LEARNING

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Abstract

This study investigated the Nigerian Senior Secondary School students' utilization of digital technologies for instructional purposes. It also investigated the related motivating factors for students' engagement of digital technologies for learning; challenges facing students on the use of digital technologies; and perceived solutions to the challenges hindering students from engaging in digital technologies for learning. A descriptive study of the survey type was used in conducting the study. A total of 600 copies of researcher-designed questionnaires were randomly administered to secondary school students in Kwara State out of which 578 respondents participated in the study. Four research questions guided this study and were answered by analyzing the data collected using frequency counts, simple percentages and mean. The findings revealed that aside from students and teachers not having sufficient knowledge on the use of digital technologies in facilitating teaching and learning, the high cost of digital technologies, subscription to the internet, unstable internet connectivity and erratic nature of electricity were the challenges confronting students from engaging digital technologies for pedagogic experiences. Recommendations were proffered on the provision of stable internet connectivity, electricity and procurement of adequate digital technologies. Also, seminars should be organized for teachers and students on judicious engagement of digital technologies in facilitating teaching and learning.

Keywords: Engagement, Nigerian Secondary School Students,

Introduction

The deployment and engagement of instructional technology has continued to play a major role for pedagogic experiences within and outside the classroom. Digital technologies are powerful instructional devices that help to improve learning in various ways. The use of these technologies enables instructors to easily generate instructional materials and provides new methods to learn and collaborate (Haleem, Javaid, Qadri & Suman, 2022). The use of digital technologies provide easy access to information, retention of information, enhance increased storage of information and

improved presentation of information, thereby enable learning to be more interactive, easy to disseminate knowledge and arouses interest towards learning (Grainger, Liu & Geertshuis, 2021; Lacka & Wong, 2021). It facilitates creativity, thereby encouraging cutting edge thinking individually and learning outside the traditional techniques. Both developed and developing nations of the world adopt remote learning technologies by using combinations of radio, television, online and mobile platforms to teach and learn.

The emergence of digital era and the use of Internet connectivity worldwide facilitate instructional designers, students and teachers to use advanced digital technology's potential to revolutionise education in such way that effective and efficient instruction is accessible available to everyone and everywhere (Varea, González-Calvo & García-Monge, 2022; Carvalho, Monteiro & Martins, 2022). Traditional classroom instructions fall short of providing an immediate learning environment, faster evaluations, and more engagement, which digital learning tools and technology fill this void via judicious engagements (Vakaliuk, Spirin, Lobanchykova, Martseva, Novitska, & Kontsedailo, 2021). The use of laptops, smartphones and other related digital technologies are becoming very popular among the public and most especially students in facilitating teaching and learning of various concepts within and outside the classrooms. Some of the efficiencies that digital technologies provide are simply unrivalled by traditional learning methodologies. The flexibility of technology and non-intrusive nature of digital technologies make learning more appealing, individualistic and collaboratively used for learning. Integrating technology into education provides students with an engaging learning experience, allowing them to remain more interested in the subject without being distracted. The utilisation of projectors, computers, and other related digital devices makes teaching, learning and studying fascinating and entertaining for students. Student learning can become more dynamic and engaging by establishing tasks in class that incorporate technology resources, oral presentations, and group participation (Haleem, Javaid, Qadri & Suman, 2022). The use digital technologies and the internet-enabled gadgets like laptops, smartphones, tablets, Chromebooks, etc.by the students facilitate rapid comprehension of concepts than the the use of "chalk and talk". Instead of taking notes on what the teacher has taught, most of the curriculum is delivered virtually to students through an engaging and interactive platform. The use of the internet has extended the options for the transmission and access to educational information thereby resulting in the rise of new communication channels. Students learn many concepts and topics on their own by using internet-enabled resources and digital classrooms to update and upgrade their knowledge banks.

Digital technologies have emerged as the saviour of education in this critical time (Javaid, Haleem, Vaishya, Bahl, Suman & Vaish, 2020). Digital technologies assist in developing abilities that will require students' professional performance, such as problem-solving, thinking structure creation, and process comprehension (Araújo, Knijnik & Ovens, 2021); and help to improve the classroom environment by making teaching-learning process become more fascinating and captivating (Seale, Colwell, Coughlan, Heiman, Kaspi-Tsahor & Olenik-Shemesh, 2021). However, some challenges encountered were the newness and acceptance of these devices for teaching and

learning. Digital technologies seemed to become a formidable strategy used by both teachers and students to manage initially since traditional instructors are hesitant to include contemporary technology and gadgets in school. Some teachers envision the deployment and engagement of newer technologies as distractions rather than intelligent learning devices (Vakaliuk, Spirin, Lobanchykova, Martseva, Novitska, & Kontsedailo, 2021). Therefore, this study aimed at investigating the Nigerian Senior Secondary School students' utilization of digital technologies for learning, related motivating factors for students' engagements of digital technologies for learning, challenges facing students on the use of digital technologies and perceived solutions to the challenges hindering students from engaging digital technologies for learning.

Statement of Problem

Globally, there was swift embrace of ICTs utilization and other related digital technologies by all and sundry due to paradigm shift from traditional method of accessing information to the use of digital technologies. Despite the clamouring for utilization of ICT in facilitating pedagogic experiences in many schools, chalkboard, whiteboard, textbooks, charts, radios/televisions and films are being used as instructional materials. Very few institutions can boast of computers, internet facilities and other related facilities. ICT in education is made up of knowledge sharing and transmission, which ICT in education does not necessarily involve physical contact between teachers and students (Orie, 2017). Population explosion of students in Nigerian public secondary schools and the trend of learning styles via engagements with the use of digital technologies compel students to become digital natives.

There seemed to be some perennial challenges that are confronting students from adequate engagement of digital technologies for learning. The use of newer technologies was challenged with the high cost of these devices and their judicious usage; which may have detrimental effects on their deployment and engagement for learning. Global Information Technology Report (2012) attested to some challenges plaguing students from engaging digital technologies as inadequate access to digital library, digital classrooms, computer laboratories, computer and other ICT related facilities, internet connectivity, epileptic power supply, wireless applications, multimedia systems and the problem of multimedia courseware development among others.

Kabiru (2019) found out that absence of information about approaches to incorporate ICT to improve the educational program, challenges in coordinating and utilizing diverse of ICT devices and inaccessibility of fund was a significant impediment to fruitful engagement of ICT in various learning institutions in Nigeria. Kennedy (2023) opined that ICT should be fused in a specialized way for improvement of instructors and ICT program should be sufficiently robust to upgrade teachers' activity in schools. Hence, this study investigated the Nigerian Senior Secondary School students' utilization of digital technologies for learning, related motivating factors for students' engagements of digital technologies for learning, challenges facing students on the use of digital technologies and perceived solutions to the challenges hindering students from engaging digital technologies for learning.

Purpose of the Study

This study aimed at investigating the Nigerian senior secondary school students' engagements of digital technologies for learning. Specifically, this study:

i. Found out the secondary schools' students' utilization of digital technologies for learning.
ii. Investigated the related motivating factors for students' engagement of digital technologies for learning.
iii. Determined the challenges facing students while using digital technologies for learning.
iv. Found out the perceived solutions to the challenges hindering students from engaging digital technologies for learning

Research Questions

The following research questions guided this study:

1. Do secondary schools' students use digital technologies for learning?
2. What is the frequency of students' engagement of digital technologies for learning?
3. What are the challenges facing students on using digital technologies towards learning?
4. What are the perceived solutions to the challenges hindering students from engaging digital technologies for learning?

Methodology

This research was a descriptive study using the survey approach. The population for this study was all senior secondary school students in Kwara State, Nigeria. A total of 600 copies of researcher-designed questionnaires were randomly administered to secondary schools' students in Kwara State out of which 578 respondents participated in the study. The data collected was analysed using frequency counts, simple percentages and mean. A researcher-designed questionnaire was used to ascertain the respondents' opinion on senior secondary school students' utilization of digital technologies for learning, related motivating factors for students' engagements of digital technologies for learning, challenges facing students on the use of digital technologies and perceived solutions to the challenges hindering students from engaging digital technologies for learning and the related solutions were proffered. The draft of the instrument was subjected to face and content validity of the items by given instrument to three educational technologists and test and measurement specialists to ensure its suitability. The reviewed draft of the instrument was pilot tested on 40 students outside the domain where the study was conducted. The data collected were analysed using Cronbach alpha to measure the internal consistency of the instrument.

Results

The senior secondary school students' responses to the utilization of digital technologies for learning, related motivating factors for students' engagements of digital technologies for learning, challenges facing students on the use of digital technologies and perceived solutions to the

challenges hindering students from engaging digital technologies for learning and the related solutions were proffered by collecting, collating and analysed the data using frequency counts, means and percentages to explore engagement among secondary schools students in Kwara State, Nigeria. A total of 600 copies of researcher-designed questionnaires were randomly administered to secondary schools' students in Kwara State out of which 578 respondents participated in the study. Five hundred and seventy- eight (578) male and female senior secondary school students who were randomly selected and participated in the study. Table 1 shows the analyzed data on research question 1: Do secondary schools students use digital technologies for learning?

Research question 1: Do secondary schools students use digital technologies for learning?

Table 1: Frequency of use of digital technologies for learning

S/N	Item	Mean
1.	Camera	2.54
2.	Computer	2.73
3.	Projector	2.40
4.	Internet	2.52
5.	Mobile Phones	2.56
	Grand mean	2.54

Table 1 revealed that use of computer has the highest mean of 2.73; mobile phones have the mean score of 2.56; camera has mean of 2.54 and the use of internet has mean of 2.52 while the use of projector has the lowest mean of 2.40. The grand mean score for utilization of digital media is 2.54. Therefore, it was inferred that students make use of digital technologies in facilitating learning.

Research question 2: What are the motivating factors for students' engagement of digital technologies for learning?

Table 2: Motivating Factors for Students' Engagement of Digital Technologies

S/N	Item	Mean
1.	Use of digital technologies improves learning	3.10
2.	It facilitate learning individually anytime and anywhere	2.52
3.	It enhances engagement of students to explore varieties of concepts	2.71
4.	Use of digital technologies increases students motivation towards learning	2.10
5.	The use of digital technologies facilitate collaborative learning	2.53
	Grand mean	2.59

Table 2 shows the motivating factors for students' engagement of digital technologies for learning. The use of digital technologies improves learning has the highest mean of 3.10; digital technologies enhance engagement of students to explore varieties of concepts has the mean of 2.71; the use of digital technologies facilitate collaborative learning has mean of 2.53; digital technologies facilitate learning individually anytime and anywhere has mean of 2.52; use of digital technologies increases students' motivation towards learning has the lowest mean of 2.10. Considering the benchmark of 2.5 revealed that access to digital technologies for improved learning, exploration of diverse concepts individually at anytime and anywhere and collaborative learning were the motivating factors for students' engagement of digital technologies for learning. The grand mean score of 2.59 revealed students' consideration as motivating factors on engagement of digital technologies for learning.

Research question 3: What are the challenges facing students on using digital technologies towards learning?

Table 3: Challenges facing students on the use of digital technologies

S/N	Items	Mean
1.	Students' inadequate knowledge on the use of digital technologies	2.20
2.	Digital technologies are not easily affordable due to their cost	2.73
3.	Inadequate knowledge hinder some teachers to engage them for teaching	2.64
4.	Subscription to the internet is not affordable	2.65
5.	Unstable internet connectivity to engage digital technologies for learning	2.63
6.	Erratic nature of electricity mostly hinder their use for learning	2.53
	Grand Mean Score	2.56

The table 3 revealed the challenges facing the use of digital media as thus: digital technologies are not easily affordable due to their cost has the highest mean of 2.73, Subscription to the internet is not affordable has mean 2.65, inadequate knowledge hinder some teachers to engage them for teaching has mean of 2.64; unstable internet connectivity to engage digital technologies for learning has mean of 2.63; erratic nature of electricity mostly hinder their use for learning has mean of 2.53. Students' Inadequate knowledge on the use of digital technologies has the lowest mean of 2.20. The grand mean of challenges facing the use of digital technologies is 2.56. Therefore, it can be inferred that aside that the students are not having sufficient knowledge on the use of digital technologies, digital technologies are not easily affordable due to their cost, subscription to the internet is not affordable, unstable internet connectivity, erratic nature of

electricity and inadequate knowledge hinder some teachers to engage the use of digital technologies for teaching.

Research question 4: What are the perceived solutions to the challenges hindering students from engaging digital technologies for learning?

Table 4: Perceived Solutions to the Challenges

S/N	Item	Mean
1.	Attending seminar and trainings on the use of digital technologies	2.75
2.	Students' self-development to acquire technical skill on the use of digital technologies	2.67
3.	Internet subscription provider should improve on the connectivity	2.63
4.	Subscription to the internet should be subsidized and affordable to learners	2.50
5.	Professional development on update teaches skills and knowledge on the use digital technologies should be encouraged	2.55
6.	School administrator should procure the needed digital technologies for use	2.74
7.	Constant supply of electricity through generating plant or solar source	2.65
	Grand Mean	3.01

Table 4 shows the analysis on the solution to the challenges facing the using of digital technologies in secondary schools. Attending seminar and trainings on the use of digital technologies has the highest mean of 2.75 then the statement that school administrator should procure the needed digital technologies for use has mean of 2.74, also students' self-development to acquire technical skill on the use of digital technologies has mean 2.67 while constant supply of electricity through generating plant or solar source with mean 2.65. Internet subscription provide should improve on the connectivity has mean of 2.63, while professional development on update teaches skills and knowledge on the use digital technologies should be encouraged has mean 2.55. The statement subscription to the internet should be subsidized and affordable to learners has the lowest mean of 2.50. The grand mean of solution to the challenges facing digital media is 3.01. The implication is that challenges facing students towards the use of digital technologies can be remediated via the suggested solutions.

Discussions

This study investigated the Nigerian Senior Secondary School students' utilization of digital technologies for learning, related motivating factors for students' engagements of digital

technologies for learning, challenges facing students on the use of digital technologies and perceived solutions to the challenges hindering students from engaging digital technologies for learning were proffered. Based on research questions 1 utilization of digital technologies for instruction, the results of this study agreed with Haleem, Javaid, Qadri and Suman (2022) that digital technologies were frequently utilized for due to the fact that the provide easy access to information, retention of information, enhance increased storage of information and improved presentation of information, thereby enable learning to be more interactive, easy to disseminate knowledge and arouses interest towards learning (Grainger, Liu & Geertshuis, 2021; Lacka & Wong, 2021). Both developed and developing nations of the world adopt the use of remote learning technologies by using combinations of radio, television, online and mobile platforms to teach and learn. The findings from this study concurred with Lacka and Wong (2021) that their frequent utilization facilitates creativity, thereby encouraging cutting edge thinking individually and learning outside the traditional techniques.

Based on research questions 2 on the motivating factors for students' engagement of digital technologies for learning, this study corroborates Javaid, Haleem, Vaishya, Bahl, Suman and Vaish (2020) that student learning can become more dynamic and engaging by establishing tasks in class that incorporate technology resources, oral presentations, and group participation. The use digital technologies and the internet-enabled gadgets like laptops, smartphones, tablets, Chromebooks, etc.by the students facilitate rapid comprehension of concepts than the use of "chalk and talk". Instead of taking notes on what the teacher has taught, most of the curriculum is delivered virtually to students through an engaging and interactive platform (Haleem, Javaid, Qadri & Suman, 2022). Students learn many concepts and topics on their own by using internet-enabled resources and digital classrooms to update and upgrade their knowledge banks. Digital technologies assist in developing abilities that will require students' professional performance, such as problem-solving, thinking structure creation, and process comprehension (Araújo, Knijnik & Ovens, 2021); and help to improve the classroom environment by making teaching-learning process become more fascinating and captivating (Seale, Colwell, Coughlan, Heiman, Kaspi-Tsahor & OlenikShemesh, 2021).

Research question 3 on what are the challenges facing students on using digital technologies towards learning? The study agreed with Vakaliuk, Spirin, Lobanchykova, Martseva, Novitska, and Kontsedailo, (2021) that there are some perennial challenges that are confronting students from adequate engagement of digital technologies for learning. Some teachers envision the deployment and engagement of newer technologies as distractions rather than intelligent learning devices (Kennedy, 2023). The use of newer technologies was challenged with the high cost of these devices and their judicious usage, which may have detrimental effects on their deployment and engagement for learning. Global Information Technology Report (2012) attested to some challenges plaguing students from engaging digital technologies as inadequate access to digital library, digital classrooms, computer laboratories, computer and other ICT related facilities, internet connectivity, epileptic power supply, wireless applications, multimedia systems and the problem of multimedia courseware development among others. Kabiru (2019) found out challenges in coordinating and

utilizing diverse of ICT devices and inaccessibility of fund was a significant impediment to fruitful engagement of ICT in various learning institutions in Nigeria.

Research question 4 provided answers on what are the perceived solutions to the challenges hindering students from engaging digital technologies for learning? The findings from this study agreed with Kennedy (2023) opined that ICT should be fused in a specialized way for improvement of instructors and ICT program should be sufficiently robust to upgrade teachers' activity in schools through attending seminar and trainings on the use of digital technologies, students' self-development to acquire technical skill on the use of digital technologies. Digital technologies assist in developing abilities that will require students' professional performance, such as problem-solving, thinking structure creation, and process comprehension (Araújo, Knijnik & Ovens, 2021); and help to improve the classroom environment by making teaching-learning process become more fascinating and captivating (Seale, Colwell, Coughlan, Heiman, KaspiTsahor & Olenik-Shemesh, 2021); of which internet connectivity should be improved upon, likewise the subscription to the internet should be subsidized and affordable rate to the users (Kennedy, 2023; Vakaliuk, Spirin, Lobanchykova, Martseva, Novitska, & Kontsedailo, 2021); professional development on update teaches skills and knowledge on the use digital technologies should be encouraged (Varea, González-Calvo & García-Monge, 2022); school administrator should procure the needed digital technologies for use, constant supply of electricity through generating plant or solar source (Carvalho, Monteiro & Martins, 2022).

Conclusions

The findings from this study revealed that most students frequently use the available digital technologies in facilitating learning. Considering the motivating factors on engagement of digital technologies for learning, access to digital technologies for improved learning, exploration of diverse concepts individually at anytime and anywhere and collaborative learning were the related factors that motivate students to engage the use of digital technologies for learning. However, aside that the students are not having sufficient knowledge on the use of digital technologies, digital technologies are not easily affordable due to their cost, subscription to the internet is not affordable, unstable internet connectivity, erratic nature of electricity and inadequate knowledge hinder some teachers to engage the use of digital technologies for teaching. The perceived solutions to remediate the challenges are: organizing seminar and trainings on the use of digital technologies for teacher and students, students' self-development to acquire technical skill on the use of digital, technologies, internet subscription provider should improve on the connectivity, subscription to the internet should be subsidized and affordable to learners, professional development on update teaches skills and knowledge on the use digital technologies should be encouraged, school administrator should procure the needed digital technologies for use and constant supply of electricity through generating plant or solar source.

Recommendations

To remediate the perceived challenges confronting students on the use of digital technologies, the following recommendations were suggested:

1. Seminars should be organized for teachers and students on judicious engagement of digital technologies in facilitating teaching and learning
2. Students' self-development to acquire technical skill on the use of digital should be encouraged.
3. Teachers' professional development on knowledge and skills to acquire on the use digital technologies for teaching.
4. Internet subscription provider should provide stable internet connectivity.
5. Internet subscription should be subsidized, affordable and accessible to students.
6. School administrators should procure the needed and adequate digital technologies.
7. Constant supply of electricity should be provided through generating plants or solar sources.

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