

Availability and Utilization of Digital Technological Tools for Curriculum Instruction among Secondary Schools in Nsukka Urban of Enugu State
By

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Abstract

The study examined the availability and utilization of digital technological tools for curriculum instruction among secondary schools in Nsukka Urban of Enugu State. Two research questions guided the study. Descriptive survey design was adopted for the study. The study population was 102 basic science and technology teachers in 8 secondary schools in Nsukka Urban of Enugu State Nigeria. Due to the manageable size of the population, there was no sampling. The instrument for data collection was an adapted questionnaire titled: Availability and Utilization of digital technological tools for curriculum instruction (AUDTCI). The instrument was validated by three experts from University of Nigeria Nsukka. In order to ensure the reliability of instrument, twenty basic science and technology teachers in Igbo Etiti Local Government Area of Enugu State who share similar characteristics with the study population but were not part of the population of study were trial tested. The data collected were computed using Cronbach Alpha technique. The internal consistency of the instrument was obtained as 0.86 which was considered appropriate for the study. The researchers administered the instrument directly to the respondents in the 8 secondary schools with the help of ten research assistants who were instructed on what is required. Only 98 copies of the questionnaire were collected immediately after completion which yielded a 96% return rate. The research data collected were analyzed using mean and standard deviation. Based on the findings, the study concluded that digital technological tools are very lowly available and also very lowly utilized for curriculum instruction in secondary schools in Nsukka Urban of Enugu State. The study recommended amongst others that Education funders in Nigeria such as the Federal and State ministry of Education should allocate adequate funds to facilitate acquisition and installation of necessary digital technological tools and facilities in secondary schools across the country.

Keywords: Digital technologies, technological tools, curriculum, Instruction, secondary school education.

Introduction

Globally, educational systems are undergoing digital technological advancement to enhance effective instructional delivery and secondary school education in Nigeria is not left out in this emerging development. Secondary school education in Nigeria is a

six-year program divided into two three-year phases: Junior Secondary School (JSS) and Senior Secondary School (SSS) (Ukata et al., 2017). It serves as a bridge between primary and tertiary education, preparing students for higher education or vocational training. Junior Secondary School (JSS) is a three-year phase

which is part of Nigeria's Universal Basic Education program, aiming to provide free and compulsory education up to the JSS 3 level. JSS curriculum includes both academic and pre-vocational subjects. The Senior Secondary School (SSS) is a three-year phase which prepares students for tertiary education (universities, polytechnics, etc.) or vocational training. The SSS curriculum is more diversified, with core subjects and electives (Olofsson et al., 2020). Students who successfully complete JSS can progress to SSS, and those who complete SSS can pursue further education or vocational training. Secondary education is crucial for developing a nation's human capital and preparing individuals for various roles in society. It equips students with the knowledge, skills, and values necessary for both further education and contributing to the nation's development. The curriculum at both JSS and SSS levels includes a range of subjects such as English, Mathematics, Science, Social Studies, vocational subjects, and more.

One of the most universally accepted definition of curriculum is that provided by Tanner and Tanner (1975) in Ebisine (2015) who defined the term as planned and guided learning experiences and intended learning outcomes, formulated through the systematic reconstruction of knowledge and experiences, under the auspices of the school, for the learner's continuous and willful growth in social competence. This definition shows that when curriculum is well planned it will lead to all round development of the learner. Okonkwo and Ozurumba (1989) in Ebisine (2015) stressed that curriculum is a planned and directed activity programme meant to facilitate the achievement of educational purposes. Educational purpose can only be achieved if the curriculum content and learning experiences are well implemented. Curriculum instruction and implementation are largely implemented in schools by teachers/educators and the school

management. The school management system in most Nigerian secondary schools are usually made up of the school principal, vice principals (academic and administrative principals), subject heads and unit heads of departments. Curriculum is operated within a system, so, it is understandable that changes in education system will call for a revision of curriculum. Adelakun and Omolola, (2020) noted that curriculum innovation due to technological advancement and revolution is dramatically changing every facet of human life from educational, industry, economy, polities, culture and medicines to a myriad of others. This technological advancement and revolution is championing the adoption of digital technological tools for curriculum instruction in secondary schools.

In the view of Nwachukwu and Asom (2015), digital technological tools are extension of Information and Communication Technologies (ICT) which encompass a range of hardware, software applications and information systems that generate, store or process data. According to Olika et al, (2019), digital technologies are electronic tools, systems, devices and resources that generate, store or process data. Hennessy et al, (2013), stated that digital technological tools include social media, online games and applications, multimedia, productivity applications, cloud computing, interoperable systems and mobile devices. Ozili (2020) and Olaitan (2020), stated that some digital technologies platforms include; Microsoft teams, google hangout, skype, Bamboo learning, google classroom, Docebo, WiziQ Adobe captivate, Elucidat, GoToMeeting.com, Skype.com, Google Classroom/Open among others. Dhawan (2020), opined that digital technological tools have the potential to improve access to education and increase secondary school enrolments. The appropriate use of digital technological tools and pedagogical approach in teaching could generate an improvement in the learning results of the students (Krull

&Duart, 2017). In the same vein digital technological tools according to Briz-Ponce et al, (2017), can enable secondary schools to utilize a set of features such as flexibility, ubiquity and portability in learning that will be of great benefit to teachers and students in the new digital era. Similarly, Corbeil and Corbeil (2015), stressed that digital technological tools enable teachers to work with experts outside their areas to enhance the quality and relevance of their training provision.

Despite the potential contribution of digital technological tools in secondary education globally, its availability and utilization is threatened with so many challenges, especially in Nsukka Urban of Enugu State Nigeria. In the view of OwoandDeebom, (2020), digital technological tools require infrastructural resources such as internet connectivity, computer/laptop, webcam, headset and printers. Lack of teacher preparedness in most secondary schools in Nsukka Urban also pose serious challenge to shifting from traditional teaching methods to modern ICT-based teaching methods (Anekwe, 2017). Edwin and Stela (2016) noted that lack of adequate funding hinders the development of infrastructure, training of staff in ICT implementation and application in most secondary schools within Nsukka Urban. The use of digital technological tools in secondary schools in Nsukka Urban are challenged because of many factors including lack of availability of resources, lack of poor infrastructure, large class sizes, improper training for stakeholders, lack of manpower, and lack of teacher knowledge and skills to integrate ICT (Okolie & Asfa, 2017). Lack of adequate remuneration and rewards from the government according to Eze (2013), reduce the enthusiasm and commitment of teachers in utilization of modern instructional facilities. Considering the potentials of digital technological tools in teaching and learning, it is essential to assess its availability and

utilization for interactive learning in secondary schools in Nsukka Urban of Enugu State.

Statement of the Problem

There has been an increasing yearning for improvement and advancement in the quality of teaching and learning in secondary schools through adequate provision of necessary resources needed for effective teaching-learning process. This demand for access to relevant teaching and learning resources has brought about the emergence and inclusion of digital technological tools in most schools. Knowledge acquisition is changing through digital technological tools. One of the aims of digital technological tools is to improve the quality of education and expand access to education. The education sector is expected to be technologically driven and requires that technological resources are fully integrated in it. A technology-integrated curriculum instruction is also motivated by the global shift towards student-centred teaching methodologies, emphasizing active learning and incorporating diverse educational resources. While curriculum resource integration is recognized as a potentially impactful strategy for enhancing teaching and learning outcomes, its practical implementation faces challenges, particularly within secondary schools in Nsukka Urban of Enugu State.

Studies indicate that most secondary schools in Nsukka Urban of Enugu State Nigeria is lacking the necessary digital technological tools needed to bring the education to international standards. Studies show that most secondary schools in Nsukka Urban of Enugu State are underfunded with grossly inadequate facilities for effective training and where digital technological facilities exist, they are obsolete which has contributed to a decrease in the quality of secondary education in Nsukka Urban of Enugu Nigeria. Therefore, considering the potential of digital technological tools, there is

a need to assess the availability and utilization of digital technological tools for curriculum instruction among secondary schools in Nsukka Urban of Enugu State Nigeria.

Purpose of the Study

The purpose of the study is to determine the availability and utilization of digital technological tools for curriculum instruction among secondary schools in Nsukka Urban of Enugu State Nigeria. Specifically, the study determined:

1. The availability of digital technological tools for curriculum instruction among secondary schools in Nsukka Urban of Enugu State Nigeria.
2. The utilization of digital technological tools for curriculum instruction in secondary schools in Nsukka Urban of Enugu State Nigeria.

Research Questions

The following research questions are formulated to guide the conduct of this study:

1. What are the digital technological tools for curriculum instruction among secondary schools in Nsukka Urban of Enugu State Nigeria?
2. To what extent is the utilization of digital technological tools for curriculum instruction in secondary schools in Nsukka Urban of Enugu State Nigeria?

Research Hypothesis

Ho: There is no significant difference between availability and utilization levels of digital technological tools for curriculum instruction among the secondary schools in Nsukka Urban of Enugu State Nigeria.

Methodology

The study used a descriptive survey research design because it is suitable for gathering data from a large population through

questionnaires. The study population comprises of 102 basic science and technology teachers in 8 secondary schools in Nsukka Urban of Enugu State Nigeria. The secondary schools include; Urban Boys Secondary School Nsukka, Urban Girls Secondary School Nsukka, Queens Secondary School Nsukka, City Comprehensive Secondary School Orba Road Nsukka, Queen of Rosary Secondary School Nsukka, St. Catherine Comprehensive Secondary School Nsukka, St. Theresa Secondary School Nsukka, Community Secondary School Nru Nsukka, and Federal Government Girls College Lejja Nsukka. Due to the manageable size of the population, the entire population of 102 was used as the sample size. The instrument for data collection in this study was an adapted questionnaire titled; questionnaire on Availability and Utilization of digital technological tools for curriculum instruction (QAUDTTCI). The questionnaire was adapted from a questionnaire developed by George et al, (2022) titled; Digital Technologies for TVET Interactive Learning in Universities in Nigeria (DITTVETILUN). The questionnaire has Part A and B with items each for mean rating of respondents on availability and utilization of digital technological tools for curriculum instruction among secondary schools in Nsukka Urban. Four-point rating scales of Very Highly Available (4), Highly Available (3), Lowly Available (2) and Very Lowly Available (1) and Very Highly Utilized (4), Highly Utilized (3), Lowly Utilized (2) and Very Lowly Utilized (1) were provided for respondents to make their responses on availability and utilization of digital technologies, respectively, for TVET interactive learning in Universities in SouthEast geopolitical zone, Nigeria. Similarly, the cut-off points for the interpretation of the mean of the respondent's opinions on digital technologies availability and utilization were Very Highly Available (3.50-4.00), Highly Available (2.50-3.49),

Lowly Available (1.50-2.49) and Very Lowly Available (1.00-1.49) and Very Highly Utilized (3.50-4.00), Highly Utilized (2.50-3.49), Lowly Utilized (1.50-2.49) and Very Lowly Utilized (1.00-1.49), respectively.

The instrument was validated by one expert from the department of Measurement and Evaluation, University of Nigeria Nsukka and two experts from the Department of Industrial Technical Education, University of Nigeria Nsukka all from the in Enugu State. The experts after examining the instrument, made some corrections based on the ambiguity of the statement, comprehensiveness, adequacy and relevance to set objectives of the study and corrections were affected from the experts' opinion. In order to ensure the reliability of instrument, twenty basic science and technology teachers in Igbo Etiti Local

Research Question 1

What are the digital technological tools for curriculum instruction among secondary

Table 1

Digital technological tools for curriculum instruction in secondary schools in Nsukka Urban of Enugu State Nigeria

S/N	Digital technological tools	N	Mean	SD	Remarks
1	Dropbox	98	1.30	0.835	VLA
2	Skype	98	1.36	0.895	VLA
3	Slack	98	1.54	1.203	VLA
4	Zoom	98	1.05	1.025	VLA
5	Trello	98	1.16	0.883	VLA
6	Quizizz	98	1.18	0.909	VLA
7	Seesaw	98	1.92	0.978	VLA
8	Playposit	98	2.13	0.891	VLA
9	Peergrade	98	1.58	1.130	VLA
10	Padlet	98	3.18	1.287	VLA
11	Noon Academy	98	2.16	0.883	VLA
12	Liveband	98	2.18	0.909	VLA
13	Kahoot	98	1.12	0.978	VLA

Government Area of Enugu State who share similar characteristics with the study population but were not part of the population of study were trial tested. The data collected were computed using Cronbach Alpha technique. The internal consistency of the instrument was obtained as 0.86 which was considered appropriate for the study.

The researchers administered the instrument directly to the respondents in the 8 secondary schools with the help of ten research assistants who were instructed on what is required. Only 98 copies of the questionnaire were collected immediately after completion which yielded a 96% return rate. The research data collected were analyzed using mean and standard deviation.

Results

schools in Nsukka Urban of Enugu State Nigeria?

14	GeoGebra	98	1.10	0.891	VLA
15	FormsApp	98	1.11	1.130	VLA
16	Evernote	98	1.10	1.287	VLA
17	Edpuzzle	98	1.16	0.883	VLA
18	Edmodo	98	1.10	0.909	VLA
19	Duolingo	98	1.12	0.978	VLA
20	Diksha	98	1.03	0.891	VLA
21	Class dojo	98	1.18	1.130	VLA
22	CommonLit	98	1.08	1.287	VLA
Weighted Average		98	1.21	0.872	VLA

Table 1 presented the results of the data analysis on the availability of the digital technological tools for curriculum instruction among secondary schools in Nsukka Urban of Enugu State Nigeria. The data presented in Table 1 indicates a total mean of 1.21. This is an indication that digital technological tools are very lowly available for curriculum

instruction among secondary schools in Nsukka Urban of Enugu State, Nigeria.

Research Question 2

To what extent is the utilization of digital technological tools for curriculum instruction in secondary schools in Nsukka Urban of Enugu State Nigeria?

Table 2

Utilization of digital technological tools for curriculum instruction in secondary schools in Nsukka Urban of Enugu State Nigeria

S/N	STATEMENTS	N	Mean	SD	Remarks
1	Dropbox	98	1.30	0.835	VLU
2	Skype	98	1.36	0.895	VLU
3	Slack	98	1.54	1.203	VLU
4	Zoom	98	1.05	1.025	VLU
5	Trello	98	1.16	0.883	VLU
6	Quizizz	98	1.18	0.909	VLU
7	Seesaw	98	1.92	0.978	VLU
8	Playposit	98	1.13	0.891	VLU
9	Peergrade	98	1.58	1.130	VLU
10	Padlet	98	1.18	1.287	VLU
11	Noon Academy	98	1.20	0.835	VLU
12	Liveband	98	1.06	0.895	VLU

13	Kahoot	98	2.24	1.203	VLU
14	GeoGebra	98	2.25	1.025	VLU
15	FormsApp	98	2.12	0.883	VLU
16	Evernote	98	2.11	0.909	VLU
17	Edpuzzle	98	2.32	0.978	VLU
18	Edmodo	98	1.13	0.891	VLU
19	Duolingo	98	1.28	1.130	VLU
20	Diksha	98	3.11	1.287	VLU
21	Class dojo	98	2.30	0.835	VLU
22	CommonLit	98	2.36	0.895	VLU
Weighted Average		98	1.64	1.076	VLU

Table 2 above shows the results of the analysis on the extent is the utilization of digital technological tools for curriculum instruction in secondary schools in Nsukka Urban of Enugu State Nigeria. The analysis indicates a

total mean of 1.64 from the respondents. This indicates that digital technological tools are very lowly utilized for curriculum instruction in secondary schools in Nsukka Urban of Enugu State, Nigeria.

Table 3

Test of Hypothesis: availability vs utilization (paired t-test across the 22 tools)

S/N	Tool	Availability mean	Utilization mean	Difference (Avail – Util)
1	Dropbox	1.30	1.30	0.00
2	Skype	1.36	1.36	0.00
3	Slack	1.54	1.54	0.00
4	Zoom	1.05	1.05	0.00
5	Trello	1.16	1.16	0.00
6	Quizizz	1.18	1.18	0.00
7	Seesaw	1.92	1.92	0.00
8	Playposit	2.13	1.13	1.00
9	Peergrade	1.58	1.58	0.00
10	Padlet	3.18	1.18	2.00
11	Noon Academy	2.16	1.20	0.96
12	Liveband	2.18	1.06	1.12
13	Kahoot	1.12	2.24	-1.12
14	GeoGebra	1.10	2.25	-1.15
15	FormsApp	1.11	2.12	-1.01
16	Evernote	1.10	2.11	-1.01
17	Edpuzzle	1.16	2.32	-1.16
18	Edmodo	1.10	1.13	-0.03
19	Duolingo	1.12	1.28	-0.16

20	Diksha	1.03	3.11	-2.08
21	Class dojo	1.18	2.30	-1.12
22	CommonLit	1.08	2.36	-1.28
Summary (across 22 tools)		Mean avail = 1.375	Mean util = 1.604	Mean diff = -0.2291

Paired t-test (tools as paired observations): $t(21) = -1.123$, mean difference = **-0.2291**, SD of differences = **0.9569**, two-tailed **p = 0.274**.

Table 3 above shows the result of the test hypothesis. Using the tool-level paired test, the mean utilization (1.604) is slightly higher than mean availability (1.375), but the paired difference across the 22 tools is not statistically significant ($t(21) = -1.123$, $p = 0.274$). In other words, when treating each tool as a paired observation, we accept H_0 which states that there is no significant difference between availability and utilization levels of digital technological tools for curriculum instruction among the secondary schools in Nsukka Urban of Enugu State Nigeria.

Discussion of Findings

The data presented in table 1 indicate total mean of mean of 1.21. This is an indication that digital technological tools are very lowly available for curriculum instruction among secondary schools in Nsukka Urban of Enugu State, Nigeria. The finding of the study is not in agreement with the study of Adeoye et al (2020) in George et al, (2022) who stated that slide projector, power point projector, interactive whiteboard, internet services, video conferencing facilities, satellite, digital library, interactive radio and email are not available in most secondary schools in Nigeria. The research findings are also in consonance with Ukata et al., (2017) who stated that regards to secondary school education in Nigeria, a significant number of school children and their teachers still lack access to digital technological tools and the requisite technical know-how to utilize them.

The findings from the study in Table 2 show a total mean of 1.64 from the respondents. This indicates that digital technological tools are very lowly utilized for curriculum instruction in secondary schools in Nsukka Urban of Enugu State, Nigeria. The

finding of this study is in agreement with the study carried out by Oguniode et al (2020) who concluded that modern ICT facilities are not utilized in most secondary schools and tertiary institutions in Nigeria. The findings are in line with Olofsson et al., (2020) who stated that despite the enormous potentials of ICTs and digital literacy in the educational setup, the reality however is that most educational institutions in Nigeria particularly at the secondary level are yet to fully implement and take advantage of its numerous benefits to the acquisition, processing, storing and dissemination of audio, video, textual, pictorial and numerical information necessary in the teaching and learning process.

Conclusion

The study determined the availability and utilization of digital technological tools for curriculum instruction among secondary schools in Nsukka Urban of Enugu State. Based on the findings of this study, the researchers concluded that digital technological tools are very lowly available and also very lowly utilized for curriculum instruction in secondary schools in Nsukka Urban of Enugu State. The application of digital technological tools in education signifies a shift in the conventional learning paradigm towards more technology-based learning. The use of digital technological tools for pedagogical purposes is becoming a major factor for the enhancement of teaching and learning practices in the digitalized world.

Recommendations

The following recommendations are made from the findings of the study:

1. The principals in secondary schools should carry out e-readiness surveys in

order to determine the availability of digital technological tools in their respective schools and hence fast track acquisition and installation of any missing tools for improved delivery of in-school and out-of-school learning content.

2. Education funders in Nigeria such as the Federal and State ministry Education should allocate adequate funds to facilitate

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