Assessing the Extent of Utilization of Digital Technology by Lecturers of the Department of Science Education, Akwa Ibom State University, Ikot Akpaden

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Abstract:
This study examined the use of digital technology devices in facilitating teaching and learning in Akwa Ibom State University (AKSU), Ikot Akpaden. The study adopted descriptive survey research design. Three purposes, research questions, two hypotheses were raised and formulated to guide the study. The study population was all lecturers in the Department of Science Education of the Faculty of Education AKSU. All the 22 lecturers were selected as sample size for the study, using total population purposive sampling technique. The instrument used for data collection was the researchers developed questionnaire, titled; Lecturers Utilization of Digital Technology Questionnaire (LUDTQ), face and content validation was done by three experts, a reliability coefficient of 0.82 was obtained using Cronbach Alpha. Descriptive statistics were used to answer the research questions while Pearson product-moment correlation coefficient and Chi-square contingency test were used to test hypotheses. The results of the test indicated that there was no significant difference in the extent of utilization of Digital Technology tools by male and female lecturers. The findings also revealed that there was a significant relationship between lecturers' Digital technology resources utilization for teaching and lecturers professional status. This led the researchers to conclude that the extent of use of DT facilities in teaching by the lecturers was found to be moderate. It was recommended among others that The management of Akwa Ibom State University and indeed other Universities in Nigeria should encourage the use of Digital technology resources by providing enough of these resources and ensure that they are properly used by the lecturers in order to enhance teaching and learning as well as students' achievement and interest.

Keywords: Digital Technology Resources, Lecturers, Teaching and Learning.

Introduction
The present world is driven by digital economy, implying that every aspect of human endeavor has been digitalized. A digital economy is an economy that relies heavily on digital competing technologies, where business are conducted through markets based on the internet and world wide web. In a digitalized economy economic activities result from billion of every day online connections. It is sometimes referred to as the Web economy (Wikipedia, 2020). Many countries in the world are victims of digital poverty. Digital poverty is the inability, for wide
variety of reasons, to interact fully with the
digital world. Similarly, digital capital is the
foundation of our ability to engage fully with the
digital world (Donaphy, 2020).

During the Covid-19 pandemic, many
institutions of learning at different levels were
shut down for safety reasons, because of the risk
associated with running physical schools. The
pandemic exposed many counties to
inadequacies and lapses which hitherto were not
recognized in the utilization of information and
communication technology (ICT). Although the
physical schools were shut down, climes with
high degree of digital capital were still in session,
using digital programmes to execute teaching
and learning, uninterrupted (Uko 2022). The
closure of schools as occasioned by the COVID-
19 pandemic alone affected more than 1.2 billion
learners worldwide (TRIA, 2020). Our
universities, being the citadel and hub of
learning, have critical roles to play in the
transformation of the 21st century, since they are
primarily concerned with the generation of the
required knowledge for enhancing maximum
economic and socio-political development. The
21st century universities should be able to
digitalize all their operations and academic
activities in order to create the desired impact for
sustainable development.

The evolving educational ecosystems of the 21st
century have paved way for the deployment of
limitless aspects of digital technology, for the
purpose of result oriented instructional delivery.
There are numerous available digital learning
tools, packages and platforms which help to
concretize learning, supplement classroom
instruction and even promote remediation when
there are observable deficiencies. The 21st
century teachers should be able to key into all
these if the learners must profit from classroom
instruction. The use of ICT is therefore a high
impact factor in delivering educational goals and
learning achievement. The 21st century has its
own demands which every nation must strive to
meet at every turning point. It is these demands
that determine the direction of teaching and
learning, which invariably address trending
global issues.

Learning achievement is often considered as the
most critical aspect of an instructional encounter
since it determines the outcome of the entire
gamut of the instructional process. Learning
achievement is the extent to which a learner has
attained a short or long term educational goal.
Tophart Glossary (2023) views learning
achievement as the measurement of the amount
of academic content a student learns within a
emphasized that academic achievement is crucial
in creating the most excellent quality students,
who will become great leaders of tomorrow and
manpower force, hence responsible for the
country’s economic and social development.
The importance of the economic growth of
nations cannot be estimated, as it defines their
existence.

Hanushek & Woessmann (2021) had testified
that economic growth determines the future
wellbeing of societies and that the long-term
growth in Gross Domestic Product (GDP) of
nations is a function of the skills of a nation’s
population. The benefits of digital technologies
in the classroom cannot be over emphasized. It
enhances recall, provides new stimuli, activates
learner’s responses, provides systemic and
consistent feedback, aids sequencing of
learning/task analysis as well as providing access
to rich sources of information. When optimally
used, it could facilitate meaningful learning and
bring about the desired learning achievements.
Recent global trends in the world have provided
early warning alerts to key players in the
education arena, to move away from
conventional teaching approaches, if we must
keep the education system alive and productive.
The Ebola plague of 2014, the Covid-19, the
monkey pox of 2022 and other recurring
epidemics, coupled with incidences of global
terrorism lend credence to a call for sustained
effort in the engagement of digital technologies
in instructional delivery.

Empirical Review
A study was carried out by Walan (2020),
investigating what what transpires in science
classroom when teaching depended almost
entirely on the use of digital technology. The design adopted was a case study utilizing 2 secondary school science teachers, with their grade 7 classes. Data were collected through observation and interviews with the teachers. Instrument for data collection as the modified version technological pedagogical and content knowledge framework. The result revealed that the science teachers had self-confidence in using digital technology, and utilized predetermined digital study materials as well as supplementary materials where necessary.

Ameen, Adeniji & Abdullahi (2019) conducted a study assessing teachers’ and students’ level of utilization of ICT tools for teaching and learning mathematics. The study was carried out in Ilorin, Kwara State. The design was a descriptive survey involving a population of 170 students and 50 mathematics teachers who were randomly selected from senior secondary schools in Ilorin. The instrument for the study was the researcher’s questionnaire. Data was analyzed using simple percentages and chi-square. The findings revealed among others that mathematics teachers and student utilized ICT tools in teaching and learning. And also that Mathematics teachers and students were not skilled in utilizing ICT tools. The work revealed that gender had no influence in the use of ICT tools. They recommended among others that seminars and workshops shall be organized for teachers of mathematics on both the benefits and incorporation of ICT tools into their activities as well as encouragement of students to familiarize with ICT tools as this will step up their level of competencies.

In a study investigating lecturers of fine-arts utilization of digital technology, by Olanrewaju & Odewumi (2018) in the North Central Geopolitical zone of Nigeria, a descriptive survey design was used with researcher’s designed questionnaire. The population for the study consisted of fine art lecturers in Colleges of Education and Universities in North Central Nigeria. Purposive and simple random sampling technique were used for the selection of 100 lecturers made up of 50 males and 50 females. Three research questions were raised along with two hypotheses formulated to guide the study. Simple percentage, mean, ANNOVA and T-test were used for data analysis at 0.5 level of significance. The result revealed that lecturers utilize some digital tools for their instructional delivery. The study recommended among others that tertiary institutions in general and North-Central Nigeria in particular, should procure digital technology devices for lecturers’ utilization, instruction and that they should make use of them accordingly.

Theoretical Review


The study hinges on Richard Meyers Theory of multimedia learning. It could also be referred to as cognitive load theory. The theory centers on the fact that the working memory of individual learners during a given task has limited capacity whereas the brain stand a chance of suffering from overload if learners are presented with too much information resulting in insufficient learning. The different categories of load are germane, intrinsic and extraneous effort. It therefore becomes necessary to balance the three types of load to optimal and acceptable levels appropriate for the learners, with the aid of technology. The theory is therefore relevant to this work (article) because the article is aimed at accelerating learner’s achievement through lecturers engagement of digital technology in their teachings. When lecturers utilize digital devices, it will reduce the mental load of the students during instrumental encounters, which will go a long way to saving them from being victims of mental overloads. The theory will equally be relevant to this work in the aspect of reduction of lecturers work load since they will now be engaging digital technology in their teaching.

Cognitive Load Theory (CLT) by John Sweller (1988)

The cognitive load theory was developed by John Sweller in 1988. The theory states that the working memory of individual learners during a given task has limited capacity to withstand an overload if the learners are presented with too
much information. When this happens, it will result in insufficient learning. The theory further categorizes the mental effort involved in working memories during a given task into germane, intrinsic and extraneous effort. Based on this, Sweller maintained that the three categories of loads should be balanced to an optimal and acceptable levels, appropriate for the learner’s working memory during the formation of new scheme, with appropriate instructional facilities. The theory maintains that each person has a mental “schema”, which is the series of structure that enables thinking and problem-solving to take place. The schema are contents of the of the long term memory which constitute the knowledge base and permit multiple elements to be treated as a single element (Hasler Kersten and Sweller, 2017). The processing of information takes place in the working memory, which has limited capacity to store information, hence the need to reduce the working memory load during the formation of new schema. The theory is therefore relevant to this work because the article is aimed at accelerating learner’s achievement through lecturers engagement of digital technology in their teaching. When lecturer utilize digital devices, it will reduce the mental load of the students during instructional encounters thus saving them from being victims of mental overload. The theory will equally be helpful to the lectures in the reduction of the mental work load with their engagement of digital technology. It will equally make their lesson preparations and institutional delivery easier.

Empirical Review

Yashau & Nannin (2020) conducted a study on the utilization of ICT facilities for teaching purposes among University lecturers with particular reference to the influence of gender, age, qualification and years of teaching experience. A descriptive survey design was adopted for the study. Data were collected from a sample of 433 lecturers out of a population of 928 in Abubakar Tafawa Belew University, Bauchi. Data were analyzed using mean, standard deviation and percentages. The result revealed that lecturers have the knowledge of using ICT facilities in teaching but rarely used them. It was equally found out that lecturers’ age and years of teaching experiences were significant factors influencing the level of ICT utilization in teaching. No significant difference was found due to gender and educational qualification. It was then recommended among others that regular sensitization programme on the importance of using ICT facilities should be done as it promotes and enhance students learning and academic achievement.

Ogunshola, (2019) also conducted a study examining the use of computer technology resources in facilitating teaching and learning in private senior secondary schools in Abuja Municipal Area Council (AMAC), Nigeria. A correlation research design was adopted for the study. The population of the study was made up of 12 private senior secondary schools out of 38 in AMAC, which was 32% of the population. A sample size of 240 out of 613 teachers were randomly selected from the sampled schools. Simple random sampling technique was adopted for the study. The content validity of the instrument was done. The Computer Technology Resources, and Teaching and Learning Questionnaire (CTRTLQ) was pilot tested and reliability coefficient of .78 was obtained using Cronbach Alpha. frequency counts, percentage, mean and standard deviation were used to answer the research questions while Pearson product-moment correlation coefficient was used to test hypothesis. The findings of the study revealed that there was a significant relationship between teachers’ computer technology resources utilization, and teaching and learning in private senior secondary schools in AMAC. The researcher concluded that the use of computer technology resources facilitated teaching and learning in private senior secondary schools in AMAC. It was recommended by the researcher that, the management of private senior secondary schools should encourage the use of computer technology resources by providing enough of those resources, and ensured that they are used properly by the teachers to enhance teaching and learning.
This work is therefore undertaken to establish the extent of utilization of digital technology by lecturers in the Department of Science Education, Akwa Ibom State University, believing strongly that, the more ICT complaint the lecturers are, the better for the students, the institution and the Nigerian economy.

**Purpose of the Study**

Generally, the study sought to assess the extent of utilization of digital technology by lecturers of the Department of Science Education in Akwa Ibom State University.

Specifically, the study addressed the following, to:

1. determine the utilization level of digital technology by lecturers of the department of Science Education in Akwa Ibom State University.
2. compare the utilization level of digital technology by male and female lecturers.
3. determine whether the professional status of lecturers influences the extent of utilization of digital technology in the classroom.

**Research Questions**

The following research questions guided the study:

i. To what extent do lecturers in the Department of Science Education of Akwa Ibom State University utilize digital technology in the classroom?

ii. What is the significant mean difference in the utilization of digital technology by male and female lecturers of the Department of Science Education?

iii. Does the professional status of lecturers determine the extent of utilization of digital technology in the classrooms?

**Hypotheses**

**HO1:** There is no significant difference in the extent of utilization of digital Technology tools by male and female lecturers in Akwa Ibom State University, Nigeria.

**HO2:** There is no significant relationship between the extent of digital technology resources utilization for purpose of teaching, and professional status of lecturers in AKSU.

**Methodology**

**Design of the Study**

The design of the study was a descriptive survey since the study was essentially an effort to unveil an in-depth knowledge of a prevailing phenomenon. This design is considered appropriate because a group of people or items are being studied by collecting and analyzing data from only a few people or items considered to be representative of the entire population (Nworgu, 2015). Therefore, the design served better in finding out the extent of utilization of digital technology in teaching in Science Education Department as a representative of the entire population of lecturers in AKSU.

**Area of the Study**

The study was conducted in Akwa Ibom State University. The University is a multi-campus institution of learning, established in the year 2010. The main Campus is located at Ikot Akpaden, in Mkpat Enin Local Government Area which adjoins the confluence of Ikot Akpaden – Eastern Obolo and Eket – Ikot Abasi Highway. The other Campus is located at Obioakpa in Oruk Anam Local Government Area. There are eight faculties and thirty seven academic departments in the University.

**Population of the Study**

The population for the study consists of all the lecturers in the faculty of Education in Akwa Ibom State University. But the study focused on the population of 22 lecturers in the Department of Science Education of the Faculty of Education.

**Sample and Sampling Techniques**

The sample of the study consist of all the 22 lecturers of the Department of Science Education that were selected using total population purposive sampling technique.
Instrument for Data Collection

The instrument used for data collection was the researcher’s developed questionnaire, titled; Lecturers Utilization of Digital Technology Questionnaire (LUDTQ).

Validation of the Instrument

The instrument for data collection was validated by three Experts for face and content validation from the Department of Computer Science of Akwa Ibom State University; one from the Department of Science Education and from the Department of Measurement and Evaluation in the University of Uyo. The various corrections made by them were effected in the final copy.

Reliability of the Instrument

The reliability of the instrument was determined using Cronbach Alpha and the reliability coefficient of 0.82 was obtained, indicating a high reliability index.

Method of Data Collection

The instrument for data collection consisted of 20 items questionnaire divided into two sections. Section one was to access the demographic data of the respondents while section two was to illicit reactions on the utilization of digital technology from the respondents as well. The researcher visited the lecturers in their various offices and distributed the questionnaires to them for their responses. All the questionnaires were retrieved, scored and the data collated for analysis. The instrument was a 5 point Likert Scale of Very High extent (VHE), High Extent (HE), No Extent (NE), Low Extent (LE) and Very Low Extent (VLE). It is also a scale of Strongly Agreed (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD).

Decision Rule

Responses with a mean of 3.00 were acceptable while responses below the mean of 3.00 were unacceptable.

Method of Data Analysis

Mean and Standard Deviation were used for analysis of the research questions while Chi-square contingency test was used to test hypothesis 1 and Pearson product-moment correlation coefficient was used for hypothesis 2 at 0.05 level of significance.

Results

Demographic Variables

The demographic data of the 22 lecturers that were the respondents in this study showed that most of the participants were males 15 (68.18%) while 7 (31.82%) were females. Twenty respondents 20 (90.91%), were holders of Doctor of Philosophy Degree (Ph.D) while 2 (9.09%) were master degree holders. Also, most of the respondents have their years of teaching experience between 5-30 years. There were 3 Mathematics, 3 Chemistry, 2 Integrated science, 1 Physics and 13 lecturers in other area of specialties.

Table 1 shows the different Digital technology application software and the extent of utilization by lecturers for purpose of teaching. The digital devices were divided into eight categories for easy identification and analysis as shown in Table 1.

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean</th>
<th>SD</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Presentation Software:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS PowerPoint and Google Slide</td>
<td>2.34</td>
<td>1.00</td>
<td>LE</td>
</tr>
<tr>
<td>2. Word Processing Software:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS Word and Google Docs</td>
<td>4.40</td>
<td>0.98</td>
<td>VHE</td>
</tr>
<tr>
<td>3. Spreadsheet Software:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS Excel and Google Sheet</td>
<td>4.85</td>
<td>0.96</td>
<td>VHE</td>
</tr>
<tr>
<td>4. Publishing Software:</td>
<td>1.38</td>
<td>1.01</td>
<td>NE</td>
</tr>
</tbody>
</table>

Table 1. Distribution of the Lecturers Mean Response of the Extent of Utilization of Digital Technology in Teaching
MS Publisher and Adobe in Design

5. Multimedia Software:
   Windows Media Player and Power Director
   3.81  1.00  HE

6. Educational Software:
   Microsoft Encarta and PhET interactive simulation
   1.30  1.01  NE

7. Web-Based Resources:
   Google, YouTube and E-Library
   3.50  0.92  HE

8. Mobile Application:
   YouTube, phone, WatsApp, Telegram and Google Drive
   2.34  1.00  LE

Key: 4.50 - 5.00 Very High Extent (VHE); 3.50-4.49 High Extent (HE); 2.50-3.49 Low Extent (LE); 1.50-2.49 (VLE); 1.00-1.49 No Extent (NE)

Table 1 shows the distribution of the lecturer’s responses and their mean extent of utilization of Digital technology tools. The result indicate that Presentation Software like the MS PowerPoint and Google slide showed the extent of utilization by lecturers in instruction as “Low Extent” with an overall mean of 2.34 and the standard deviation of 1.00. Word Processing was observed as “Very High Extent” with an overall mean of 4.40 and the standard deviation was 0.98. Spreadsheet software was observed as “Very High Extent” with an overall mean of 4.85 and the standard deviation was 0.96. Publishing Software was observed as “NO Extent” with an overall mean of 1.38 while the standard deviation was 1.01. Multimedia Software in the form of Windows Media Player specifies the extent of utilization and was observed as “High Extent” with an overall mean of 3.81 and the standard deviation was 1.00. Educational Software like Microsoft Encarta and PhET interactive simulation presents the extent of utilization by lecturers in instruction as “NO Extent” with an overall mean of 1.30 while the standard deviation was 1.01. The lecturers responses indicated that they were not familiar with this group of digital devices.

Web-Based Resources such as Google, YouTube and E-Library showed the extent of utilization by lecturers for the purpose of teaching as “High Extent” with an overall mean of 3.50 while the standard deviation was 0.92. Mobile Application such as YouTube, phone, WatsApp, Telegram and Google Drive applications expressed the extent of utilization of DT by lecturers in instruction as “Low Extent” with an overall mean of 2.34 and the standard deviation was 1.00. Using mobile phones, tablets, or other mobile devices for mobile application are so much relevant in today’s generation. It was revealed by their responses that, generally, Lecturers used this application less in their classroom instruction but use Mobile applications more to watch music videos, shows, and also for video-sharing services and many more and not mainly for academic purposes. Table 1 showed that the overall assessment scores for the extent of lecturers’ Digital technology resources utilization in Science Education Department, Akwa Ibom State University was 2.99, which falls within the Low Extent category. This result means that the extent of lecturers’ Digital technology resources utilization could be said to be moderate.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>15</td>
<td>3.13</td>
<td>0.73</td>
<td>High Extent</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>2.71</td>
<td>1.57</td>
<td>Low Extent</td>
</tr>
</tbody>
</table>
Table 2 shows the effect of gender on AKSU lecturers’ extent of utilization of Digital Technology facilities for teaching purposes. The result showed that male lecturers had mean response of 3.13, SD=0.73 while their female counterparts had mean response of 2.71, SD=1.57. The result further showed that the male lecturers had a slightly higher mean response that fall within the high extent compared to their female counterparts that falls within the low extent.

Table 3. Difference in Mean Response of Lecturers on Extent of Utilization of Digital Technology for Teaching Purpose by Professional Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Number</th>
<th>Mean</th>
<th>SD</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professors</td>
<td>2</td>
<td>3.54</td>
<td>0.55</td>
<td>High Extent</td>
</tr>
<tr>
<td>Associate Prof.</td>
<td>2</td>
<td>3.53</td>
<td>0.57</td>
<td>High Extent</td>
</tr>
<tr>
<td>Senior Lecturers</td>
<td>2</td>
<td>3.50</td>
<td>1.00</td>
<td>Low Extent</td>
</tr>
<tr>
<td>Lecturer I</td>
<td>15</td>
<td>2.33</td>
<td>1.43</td>
<td>Low Extent</td>
</tr>
<tr>
<td>Lecturer II</td>
<td>1</td>
<td>2.22</td>
<td>1.50</td>
<td>Low Extent</td>
</tr>
<tr>
<td>Total Cluster mean</td>
<td>22</td>
<td>3.02</td>
<td>1.01</td>
<td>High Extent</td>
</tr>
</tbody>
</table>

Table 3 showed that, lecturers with higher status (Professors, Associate Professors and Senior lecturers) had higher mean response (3.54, 3.53 and 3.50) compared to those with lower status (Lecturer I and Lecturer II) who had means rating of 2.33 and 2.22. This implies that the lecturers differ significantly on extent of utilization of Digital Technology facilities with respect to Professional status.

Table 4. Distribution of the Lecturers Mean Response of the Level of Competency in Utilization of Digital Technology in Teaching

<table>
<thead>
<tr>
<th>Level of Competency</th>
<th>Number</th>
<th>Mean</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Competent</td>
<td>3</td>
<td>2.56</td>
<td>13.64</td>
</tr>
<tr>
<td>Competent</td>
<td>10</td>
<td>1.98</td>
<td>45.45</td>
</tr>
<tr>
<td>Moderately Competent</td>
<td>5</td>
<td>1.51</td>
<td>22.73</td>
</tr>
<tr>
<td>Not competent</td>
<td>4</td>
<td>1.45</td>
<td>18.18</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>7.50</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 4 showed that 4 (18.18%) of Lecturers were Not Competent in the use of Digital Technology tools for teaching with the mean of 1.45. Also, it was revealed that 5 (22.73%) of Lecturers were Moderately competent in the use of DT tools with the mean of 1.51. The result showed that 10 (45.45%) of Lecturers were Competent in the use of Digital Technology tools for teaching and 3 (13.64%) of Lecturers were Highly Competent in utilization Digital Technology tools for teaching with mean of 2.56.

Table 5. Chi-Square Analysis of Lecturers’ Extent of Utilization of Digital Technology Tools Based on Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>VHE</th>
<th>HE</th>
<th>LE</th>
<th>VLE</th>
<th>NE</th>
<th>N</th>
<th>df</th>
<th>X²</th>
<th>p.&lt;0.05</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2 (2.05)</td>
<td>4 (3.41)</td>
<td>5 (4.77)</td>
<td>2 (2.05)</td>
<td>2 (2.73)</td>
<td>15</td>
<td>3</td>
<td>2.60</td>
<td>7.83</td>
<td>NS</td>
</tr>
<tr>
<td>Female</td>
<td>1 (0.95)</td>
<td>1 (1.59)</td>
<td>2 (2.23)</td>
<td>1 (0.95)</td>
<td>2 (1.27)</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A 2X5 Chi-square contingency test was carried out to test the null hypothesis that “there is no significant difference in the extent of utilization of Digital Technology tools by male and female lecturers in Akwa Ibom State University, Nigeria. The results of the test presented in Table 6 indicates that there is no significant difference in the extent of utilization of Digital Technology tools by male and female lecturers, because the p-value (7.82) is greater than 2.60 at 0.05 level of significance. Therefore, the hypothesis was not rejected. This therefore means that gender does not have effect on the lecturers’ extent of utilization of Digital Technology tools for teaching purpose.

HO2: There is no significant relationship between the extent of digital technology resources utilization for purpose of teaching, and professional status of lecturers in AKSU.

Table 6. Pearson’s Product Moment Correlation Analysis of the Relationship Between Lecturers’ Extent of Utilization of Digital Technology for Teaching and Professional Status

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>(\bar{X})</th>
<th>SD</th>
<th>(r)</th>
<th>P-Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilization of Digital Tech.</td>
<td>22</td>
<td>2.99</td>
<td>1.00</td>
<td>0.36</td>
<td>0.00</td>
<td>Not</td>
</tr>
<tr>
<td>Professional Status</td>
<td>22</td>
<td>3.02</td>
<td>1.01</td>
<td></td>
<td></td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Note: **Correlation is Significant at 0.05 level of significance

Table 6 showed that the calculated value of Pearson product-moment correlation \((r)\) were 0.36, which indicated that there is a positive relationship between lecturers’ Digital technology resources utilization for teaching and their professional status in AKSU. Furthermore, the p-value of 0.00 is less than 0.05 significance level. This means that there is a significant relationship between lecturers’ Digital technology resources utilization for teaching and lecturers professional status. The hypothesis was not accepted. This implies that the lecturers differ significantly on extent of utilization of digital technology facilities with respect to professional status. A closer look at the analysis reveals that there was a significant difference between lecturers in the professorial class, senior lecturers and other professional classes. The result therefore established a significant relationship between lecturers with lower years of teaching experience and those with higher years of teaching experiences with respect to extent of utilization of digital technology facilities for teaching purposes. This mean that lecturers with longer years of teaching experience who have also risen to the zenith of their professional cadre have higher extent of utilization of digital technology facilities in teaching compared to lecturers with lower years of teaching experience who are still in their lower professional cadre.

Discussion

The purpose of this study was to investigate the extent and competency of lecturers’ utilization of Digital Technology facilities in teaching, as well as the effect of gender and Professional status on extent of utilization of Digital Technology facilities in teaching.

Findings based on extent of utilization of Digital Technology facilities showed that lecturers in AKSU can use Digital Technology facilities for teaching purposes but in a lower extent.

The Digital Technology facilities with the highest extent of utilization are Word Processing and Spreadsheet software such as the MS Excel, MS Word, external devices, internet and PDF packages. This was followed by Multimedia Software, Web-Based Resources that had high extent of utilization. The least used Digital Technology facilities is the teaching purposes Management Systems (Google Classroom and Moodle and so on), Presentation Software like
the MS PowerPoint and Google slide and Mobile Application such as YouTube, phone, WatsApp, Telegram and Google Drive. However, Publishing Software a computer publishing application that can be utilized by lecturers to make a variety of publications especially for certificates and school program invitations and Educational Software like Microsoft Encarta and PhET interactive simulation presents the extent of utilization by lecturers in instruction as “NO Extent” as lecturers were not conversant with its usage in teaching. The cluster mean showed that overall, the lecturers can use Digital Technology facilities in teaching but in lower extent. However, they have not been using them in actual teaching. This implies that, although they can use these facilities for teaching purposes, a number of them have not been using it in their teaching. Few lecturers actually used these Digital Technology facilities in their teaching. For example, only few number of the lecturers indicated that they have used Microsoft word, Microsoft excel, Microsoft PowerPoint, Smart Board and the internet respectively. The least number of responses was from the participants who indicated that they have used Learning Management System (LMS) in their teaching.

Lecturers mostly utilized MS PowerPoint for presentation in conferences and rarely used them for teaching in the form of the different animations, themes, graphics, and so on, which are essential to get the attention of their students. Word Processing is one of the most commonly used digital technology tool by lecturers in creating their worksheets, notes, hand-outs, periodical exams, and students reports. In writing instruction using the word processing it can provide users with educational benefits because it encourages text conceptualization and frees the user from the mechanical concerns. Spreadsheet software are generally used by lecturers especially to compute grades and to keep track of the progress of their students. Multimedia Software is mainly used by lecturers for playing audios, videos, and viewing photos that are affiliated with their lessons. Educational Software is used for computer software which is made for educational purpose, but the lecturers responses indicated that they are not familiar with this group of digital devices.

Many lecturers use Web-Based Resources such as Google, YouTube and E-Library because of the information that they get back from their search. Mobile Application Using mobile phones, tablets, or other mobile devices for mobile application are so much relevant in today's generation. Generally, Lecturers used this application less in their classroom instruction even though there are so many downloadable video clips that are related in science education and may be use in their teaching. Their responses in the interview and survey suggest that, Mobile applications are used by many to watch music videos, shows, and also for video-sharing services and many more and not mainly for academic purposes. This is despite the fact that LMS such as Moodle and Google Classroom are available even on their mobile phones and E-library is available free of charge in the university for the lecturers’ use. Similarly, study conducted by Nannim & Yushau, (2019) as well as Nannim, Yushau and Gital (2018) had shown that lecturers are aware of the availability of these facilities.

The result of this study agrees with the work of Han, Cho, Kim, and Park (2019), who argued that multimedia technology has a positive impact on the perception and adoption of multimedia learning technology by the user. According to Stanisavljevic-Petrovic, Stankovic, and Jevtic, (2015), in the result of their research, they confirmed that nearly two-thirds of the students surveyed prefer to learn through educational software because they believe it is the best way to learn in school. The effect of web-based learning technology demonstrates a positive connection between the utilization of learning technology and engaging students and developing learning. The findings of Yushau, & Nannim, (2020), Ameen, Adeniji, & Abdullahi, (2019) is in consonance with the findings of this study. The results showed that lecturers have the knowledge of using DT facilities in teaching, however, they rarely use them in teaching. It was also found that lecturers’ age and years of teaching experiences were significant factors influencing the level of ICT utilization in
teaching. However, no significant difference was found due to gender and educational qualification. According to Yushau, & Nannim, (2020), mobile devices are increasingly being approved as an appropriate medium for multimedia-rich applications to meet mobile device users' needs. This result is similar to findings of previous studies (Enakriere & Ocholla, 2017; Emeasoba & Ezenwafor, 2015) which show that lecturers can use ICT facilities in universities. However, it disagrees with (Olelewe & Okwor, 2017; Nwachukwu & Asom, 2015) whose research found that most teachers cannot use ICT facilities in teaching. The result of this study is also at variance with the work of Ogunshola,( 2019) and Paje, Rogayan, & Dantic, (2021) who agreed that there was a significant relationship between teachers' digital technology resources utilization, and teaching and learning in schools. This led the researcher to conclude that the use of computer technology resources facilitated teaching and learning in private senior secondary schools.

Therefore, the low level of utilization of these facilities in teaching could be due to lack of technical knowledge of how to use these facilities in actual teaching. It could also be attributed to institutional factors such as not providing the enabling environment to use these facilities or individual factor such as lack of will power from the side of the lecturers to use the facilities in teaching. It could also be due to heavy course loads that left lecturers with less time to organize and plan how to use the available facilities in teaching. This finding is surprising because AKSU is a university that have most of these DT install in the University to be used adequately in teaching. But the lecturers’ response is showing otherwise. The lecturers’ responses further showed that they fairly used the university website, E-mail, storage devices and Research 4 life packages. The cluster mean showed that overall, the extent of use of DT facilities among AKSU lecturers is low. This finding agrees with Jumare et al. (2017) which report low extent of use of ICT facilities in teaching. Tercy (2009) also showed that the frequency of used of ICT facilities among teachers is low. However, the result disagrees with Tella et al. (2017), Nkoyo and Egbe (2016) who both reported high extent utilization of ICT facilities among lecturers.

Result on influence of gender on lecturers’ extent of utilization of DT facilities for teaching purposes in Table 5 shows that the male lecturers had a slightly higher mean response than their female counterparts. However, Chi-square test result showed that there was no statistically significant difference between the male and female lecturers on their extent of utilization of Digital Technology facilities for teaching purposes. The result of this study agrees with previous findings (Olafare et al., 2018; Yushau & Nannim, 2020). However, it is in contrast with Mahdi, & Al-Dera, (2013) which found a significant difference between male and female teachers utilization of ICT facilities in teaching.

The result in Table 5 showed that lecturers who are in the professorial class and Senior lecturers cadre had higher mean response on extent of utilization of Digital Technology facilities in teaching as compared to the lecturers in the other professional status. PPMC result showed that there was a significant relationship between the professional status. This inferred that there was a significant relationship on extent of utilization of Digital Technology facilities among lecturers within the Professorial class, senior lecturers and other classes. It can also be deduced that there was a significant relationship between the lecturers’ extent of utilization of DT facilities for teaching purposes based on Professional status. This shows that the lecturers in the professorial class and senior lecturers used DT in teaching more as compared to lecturers in the other professional classes. A plausible reason adduced for this could be that lecturers in the professorial and senio
Abdullahi, 2019), whose study showed significant difference in utilization of ICT based on age, years of teaching experience and qualification. The result from this investigation also revealed that lecturers who are Professors Associate Professors and senior lecturers had slightly higher mean response on extent of utilization of DT in teaching than those who are Lecturer I and Lecturer II. This result is not surprising because the higher status of the lecturers must have exposed them to many skills of using DT in their teaching.

The result disagrees with the findings of Gombe et al. (2016) who investigated the use of ICT by lecturers in the North-Western Nigeria and found no significant difference in the utilization of ICT based on lecturers’ qualification. The findings of Gombe et al. (2016) also showed that lecturers with Ph.D qualification had a slightly higher mean rating, followed by those with Masters’ degree, while those with Bachelors’ degrees had the least mean rating. However, the result agrees with (Olafare et al., 2018; Paje, Rogayanan, & Dantic, 2021) who found a significant difference in knowledge of use of ICT by lecturers based on their qualifications.

The findings of the study supported the findings of Bhalla (2013) who stated that teachers often used computers to update subject knowledge and teaching skills, develop lesson plans, prepare additional instructional material, notify relevant information via internet, and prepare question banks. Although the use of digital technology applications in education has shown educational benefits, changing traditional teaching and learning is yet a challenging process. Some progress is being made, but there is a need for more and advanced research aimed at improving and generalizing the positive effects of using digital technology applications in education and eliminating the negative effects of these practices.

**Conclusion**

This study investigated the extent and competency of utilization of DT facilities by lecturers in Akwa Ibom State University, Nigeria. The study found that lecturers in AKSU have the capability of using DT facilities in teaching, however, they rarely use it in their teaching. The extent of use of DT facilities in teaching by the lecturers was found to be moderate. Also, there was no significant difference on extent of utilization of DT facilities for teaching based on lecturers’ gender. However, a significant difference was found based on professional status of the lecturers. It was also observed that lecturers with higher years of teaching experience had higher competency of utilization of DT facilities in teaching compared to those with lesser years of teaching experiences. Science lecturers’ utilized digital technology in teaching but was observed that they frequently used common software and application in Science instructions. There is a significant difference between lecturer's utilization of presentation software, publishing software, and educational software as digital technology in science instruction and profile variables. Digital technology in Science instruction is a trend in the 21st century learning. The lecturers should seek its advantages. They should utilize it to improve their teaching that will greatly uplifts students learning interests. Due to various sources and applications, learning Science concepts and principles have been made easy. Preparation of instructional materials became light and interactive, this will make the teaching-learning process more effective. However, digital technology in Science instruction is a 21st century trend in learning, not all the lecturers have acquired the needed skills in digital technology. They lack skills and competency in maneuvering many digital technology applications, this affects how they prepare and set – up digital technology -based instructional materials, multimedia, documents and the like. The availability of internet connections is a huge problem also. The digital technology-based instruction became unreliable due to epileptic power supply. Due to these difficulties, lecturers just find digital technology in Science instruction too expensive to provide.
Recommendations

Based on the findings of this study, the following recommendations were made:

1. The management of Akwa Ibom State University and indeed other Universities in Nigeria should encourage the use of Digital technology resources by providing enough of these resources and ensure that they are properly used by the lecturers in order to enhance teaching and learning.

2. Efforts should be made by lecturers to upgrade their knowledge of Digital technology utilization for effective teaching and learning.

3. Also, regular workshops aimed at increasing lecturers’ level of utilization of these facilities in teaching should be organized. The workshop and training programme should also aimed at sensitizing lecturers on the importance of using DT facilities as it promotes students’ learning and enhance their academic achievement. Special interest should be on the newly recruited or less experienced lecturers.

References


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