TEACHERS' PERCEPTIONS OF THE IMPACT OF MICROSOFT LEARNING TOOLS IN TEACHING OF SCIENCE IN THE FCT-SENIOR SECONDARY SCHOOLS, NIGERIA

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Abstract

Microsoft introduced immersive education solutions to equip teachers with modern tools to make their job easier and effective. Microsoft technology such as computers, smart phones, tablets or internet devices etc. Are example of Microsoft products that support educators in keeping students engaged and safe in digital classrooms. The 21st century education has required teachers and schools in Nigeria to embrace Microsoft leaning technologies to effectively engage students in various activities. This study, therefore, aimed to reveal teachers' perceptions of the use of Microsoft products for teaching and learning of science in senior secondary schools in Federal Capital Territory, Nigeria. The descriptive survey research design was utilized and 100 science teachers from public and private schools were randomly selected using random sampling technique. E-questionnaire was used in the collection of data. Descriptive statistics were used to analyze the quantitative data. The finding of the study revealed that Microsoft products are effectively utilized by science teachers in the private schools but was not effectively available and utilized in public schools in the FCT. The result obtained revealed that Microsoft products are effective in addressing some of the major challenges encountered by teachers during teaching and learning processes. It was concluded that Microsoft need to support teachers by equipping them with affordable products that will enhance classroom organization and consequently facilitate teaching and learning processes. The study encourages wider adoption of the Microsoft tools application by schools in Nigeria.

Keywords: Teachers' perception, Microsoft products, teaching, learning, science, secondary schools, Federal Capital Territory.

Introduction

Microsoft is a leading global vendor of computer, computer software, computer hardware, mobile and gaming systems, and cloud services. (Stephen J. B. (2021). Recently Microsoft Corporation partnered with federal government of Nigeria and introduced an educational framework for the digital transformation of primary and secondary schools. such technologies includes; Technology solution, Microsoft 365, which aimed at helping teachers and the schools to upload the scores of their pupils and make them accessible to parents. Teachers have a lot of technological tools at their disposal to make their teaching effective and productive. Microsoft brings several high-end solutions to the teachers' table using its technology to improve the learning experience for students while empowering them and reducing the stress of the job (Microsoft 2018).

To prepare students for the current digital era of 21st century, teachers must be the key players in using and integrating Information and Communication Technology in their daily classrooms' activities. the objective of integration of ICT into teaching and learning of science is to improve the quality and enhance the teaching and learning activities. The utilization of ICT in the education

sector is to help teachers to face the challenges of current globalization (Albirini, 2006). The integration of ICT in education is to utilize the technology-based teaching and learning pedagogy in the classroom. Therefore, students are familiar with modern technologies and are better within technology-based circle, the integration of ICT in schools, specifically in the instructional activities is vital, Ventura-Cauilan (2022). This is because, the use of technology in education contributes a lot in the pedagogical aspects in which the application of ICT will lead to effective learning with the help and supports from ICT elements and components (Jamieson-Procter et al., 2013). However, the teaching and learning of science subjects can be learned more effectively through technology-based tools and equipment. The ICT provides the help and complementary supports for both teachers and learners where it involves effective learning with the help of the ICT tools to serve the purpose of learning aids (Jorge et al., 2003).

The need for the integration of information and communication technology in education sector is crucial, this is because with the help of technology, teaching and learning may take place when the teacher and learner are physically in distance (distance learning) using hardware tools and software applications like computer, internet, zoom etc. However, ICT integration is not a one-step learning process, but it is a continual process of learning that provides proactive teaching-learning environment (Young, 2003). Microsoft products also helps both teachers and students to learn about their respective subject areas more easily. A technology- based teaching and learning offers various interesting ways which includes educational videos, stimulation, storage of data, the usage of databases, mind-mapping, guided discovery, brainstorming, music, World Wide Web (www) that will make the learning process more fulfilling and meaningful (Finger & Trinidad, 2002). The utilization of Microsoft tools helps teachers to design their lesson plans in an effective, innovative, creative approach that would help in students' active and continues learning. The utilization of ICT in teaching will enhance the learning process and maximizes the students' abilities in active learning (Finger & Trinidad, 2002; Jorge et al., 2003; Young, 2003; Jamieson-Procter et al., 2013).

Microsoft hardware and software tools for teachers
There are various Microsoft hardware and software tools science teachers use on Windows PCs, laptops, trace-boards and compatible mobile devices to aid in the delivering of subject contents, such as Microsoft Word, Excel, and PowerPoint, Teams, OneNote, Flipgrid, Sway, Stream, OneDrive, School Data Sync, Microsoft Imagine Academy. Other Microsoft application software are; Learning Suite by Microsoft, Flashcards by Microsoft, Office 365 for Education, Photosynth, Microsoft Mathematics 4.0, Kinect for Windows SDK, Math Worksheet Generator, Digital Storytelling, Kodu, Interactive Classroom, Microsoft SkyDrive, Chemistry Add-in for Word, Mouse Mischief, Songsmith, Accessibility Guide for Educators, Microsoft Mathematics, Worldwide Telescope, Project Tuva, Ribbon Hero 2, Small Basic, Bing, Microsoft Digital Literacy Curriculum etc. are example of Microsoft application programs.

When Covid-19 pandemic forced schools to close their gates, students in China, Europe, America and many other parts of the world turned to online learning, but African students did not have that options than to dropped out of school due to lack of e-learning facilities in our schools. However, the adoption of Microsoft tools in the education sector in Nigeria is essential and capable of making the teaching and learning environment productive and effective. The systems of learning online using Microsoft tools especially during the Covid-19 pandemic such as (Learning Management Systems, zoom, google team, Video Conferencing) are mostly deployed by middle-and high-income environments while some are adopting other broadcast media like television for delivery

as a means of supplementary (Ghavifekr, S. & Rosdy, W.A.W.2015). it's believed that Microsoft made a tremendous achievement in the transformation of global education by integrating technology in the teaching and learning at all level of education. Microsoft education tools transformed global education system especially in the time of covid-19 when schools turned to online remote learning. New innovative technologies such as Microsoft Teams and Zoom, among others, become useful and effective (Seyal, Mohd, Awg, Yussof & Rahman, 2017).

Objectives of The Study
The following are the objectives of this study:

  i.   determine the level of Microsoft products utilization in teaching and learning of science
  ii.   examine the effectiveness of Microsoft products in teaching and learning of science
  iii. identify the factors limiting the use of Microsoft products in teaching and learning of science

Research Questions
  i.   What is the level of Microsoft products utilization in teaching and learning of science?
  ii.   What is the effectiveness of Microsoft products in teaching and learning of science?
  iii. What are the factors limiting the use of Microsoft products in teaching and learning of science?

Hypothesis
HO_1: Microsoft products utilization is not effective in teaching and learning of science

METHODOLOGY
Research Design
Descriptive survey research design was adopted in the study.
Population
One hundred science teachers were randomly selected as sample for the purpose of this study (65 teachers from public secondary schools and 35 teachers from private secondary schools). The Data was collected using an online questionnaire which was sent to the sampled teachers through the emails or WhatsApp numbers. This instrument was created using Microsoft Forms. The E-questionnaire was tagged "Teachers Perceptions of the Microsoft products". The questionnaire consisted of four parts; section A was used to obtain demographic data of the respondents and section B was comprised of 25 items that generated answers to the three research questions. The response format was on 4 Likert scale ranged from Strongly agree (SA) = 4, Agree (A) = 3, Strongly Disagree (SD) = 2, Disagree (D) = 1. And descriptive statistic was used to answer the three research questions and t-test was used for testing the research hypothesis at 0.05 level of significance.

Results
Table 1: Demographic background of respondents

Gender	Frequency	Percentage %
Male	45	45%
Female	55	55%
Total	100	100%

Type of school	Frequency	Percentage %
Public school	65	65%
Private school	35	35%
Total	100	100%

Location of school	Frequency	Percentage %
Urban	70	70%
Rural	30	30%
Total	**100**	**100%**

From the overall population (n=100) based on gender, there are 45 male respondents with a percentage of 45% as compared to their 55 counterpart female respondents with 55%. From the overall population based on school type 65 teachers were from public secondary schools with 65% and 35 from private schools with 35%. From the overall population based on school location 70 respondents were from urban areas with 70% and 30 respondents from rural schools with 30% respectively

Research question one: What is the level of utilization of Microsoft products in teaching and learning of science?

Table 1: Teachers' perceptions of the level of utilization of Microsoft products

Sn	Item	SA	A	SD	D	MEAN	SD	REMARKS
1.	I use Microsoft computers to browse/search the internet to collect information to prepare lessons	30	39	21	10	2.93	0.95	Agree
2.	I use Microsoft computers to Browse/search the internet to collect resources to be used during lessons	34	36	26	4	2.82	0.94	Agree
3.	I use Microsoft applications to prepare presentations for lessons	60	15	20	5	2.01	0.68	Agree
4.	Do you use Microsoft computers to Create your own digital learning materials for students	50	20	24	6	2.07	0.81	Agree
5.	I use Microsoft computers to Prepare exercises and tasks for students	52	26	21	1	1.97	0.71	Agree
6.	I Post homework for students on the google mail	56	19	17	8	2.85	0.81	Agree
7.	I use Microsoft computers to provide feedback or assess students' learning	38	35	21	6	1.97	0.75	Agree
8.	I use Microsoft computers to Evaluate digital learning resources in the subject(s) you teach	54	30	12	4	2.99	0.76	Agree
9.	I use Microsoft products to Communicate print and present results for students	33	30	28	9	2.78	0.94	Agree

10.	I Download/upload/browse material from the google website	36	30	25	9	2.74	0.93	Agree

From the table 1 above and the items number 1, 2, 3, 4, 6, 7, 8, 9 and 10 had mean ratings of 2.93, 2.82, 2.01, 2.07, 1.97, 2.85, 1.97, 2.99, 2.78 and 2.74 respectively; hence all the science teachers agreed that teachers utilized Microsoft products in teaching and learning of science in their respective schools across the FCT.

Research Question two: What is the effectiveness of Microsoft products in teaching and learning of science?

Table 2: Teachers' perceptions of the effectiveness of Microsoft products in teaching of science

SN	ITEM	SA	A	SD	D	MEAN	SD	REMARKS
1.	Microsoft tools allows teachers' to be more creative and imaginative in teaching process in my school	57	31	9	3	2.03	0.71	Agree
2.	The use of Microsoft tools helps teachers to find related knowledge and information for teaching	58	26	14	2	2.92	0.75	Agree
3.	students learn more effectively with the use of Microsoft tools	52	33	12	3	2.82	0.65	Agree
4.	The use of Microsoft tools enables teachers to be current and UpToDate in their day-to-day teaching career	54	31	13	2	2.96	0.72	Agree
5.	The use of Microsoft tools promotes active and engaging lesson for teachers' best teaching experience.	63	33	13	1	3.00	0.67	Agree

From the table 1 above and the items number 1, 2, 3, 4 and 5 had mean ratings of 2.03, 2.92, 2.82, 2.96 and 3.00 respectively; hence all the science teachers agreed Microsoft products are effective in teaching and learning of science in FCT secondary schools.

Research question three: What are the factors limiting the use of Microsoft products in teaching and learning of science?

Sn	Item	SA	A	SD	D	MEAN	SD	REMARKS
1.	Insufficient number of Microsoft computers in my school	53	39	7	1	2.79	0.57	Agree
2.	Lack of constant electricity supply to power Microsoft product	60	32	6	2	2.87	0.77	Agree

3.	Insufficient number of internets connected computers	62	27	10	1	2.83	0.60	Agree
4.	Insufficient number of interactive whiteboards	64	27	5	4	2.83	0.57	Agree
5.	School computers out of date or obsolete	60	34	5	1	2.68	0.60	Agree
6.	Lack of adequate ICT skills of teachers	53	39	5	3	2.68	0.60	Agree
7.	Teachers' Insufficient technical pedagogical support from Microsoft agents	52	38	6	4	2.71	0.62	Agree
8.	Too difficult to utilize Microsoft tools into the curriculum	46	38	10	6	2.80	0.76	Agree
9.	Lack of pedagogical models on how to utilize Microsoft tools for teaching	52	40	6	2	2.80	0.74	Agree
10.	Lack of interest of teachers in Microsoft tools	50	43	3	4	2.66	0.62	Agree

From the table 1 above and the items number 1, 2, 3, 4, 6, 7, 8, 9 and 10 had mean ratings of 2.79, 2.87, 2.83, 2.83, 2.68, 2.68, 2.71, 2.80, 2.80 and 2.66 respectively; hence all the science teachers agreed that to the factors limiting the use of Microsoft products in teaching and learning of science in the FCT schools.

Hypotheses testing

HO₁: Microsoft products utilization is not effective in teaching and learning of science

Sex	N	Mean	SD	Df	t-stat	t-crit.	Sig.(P)	Decision
Male	45	65.61	15.42	98	1.13	1.66	0.12	Accepted
Female	55	62.14	15.17					

From table 4, it is evident that the calculated t-stat value 1.13 which is less than the t-crit. value of 1.66, while the calculated p value of 0.12 is less than 0.05 level of significance at the degree of freedom (df) of 98 for 0.05 level of significance. Hence, the null hypothesis one is accepted. This indicates that Male teachers had not differ from female science teachers in the perceptions of the impact of Microsoft products on teaching and learning of science in FCT secondary schools.

Discussion of findings

From the Research question 1, the participants agreed with the items provided in the questionnaire. That science teachers use Microsoft computers to browse/search the internet to collect information to prepare lessons, science teachers use Microsoft computers to Browse/search the internet to collect resources to be used during lessons, science teachers use Microsoft applications to prepare presentations for lessons, science teachers use Microsoft computers to Create your own digital

learning materials for students, science teachers Post homework for students on the google mail, science teachers use Microsoft computers to provide feedback or assess students' learning, science teachers use Microsoft computers to Evaluate digital learning resources in the subject(s) you teach, science teachers use Microsoft products to Communicate print and present results for students and science teachers Download/upload/browse material from the google website. The results from table 2 indicates that all the science teachers agreed Microsoft products are effective in teaching and learning of science in FCT secondary schools. Table 3 also indicate that all the science teachers agreed that to the factors limiting the use of Microsoft products in teaching and learning of science in the FCT schools, this is in line with the finding of Türel and Johnson's study (2012) who revealed that technical problems become a major barrier for teachers to utilize digital teaching aids. The result from hypotheses test indicate that Male teachers had not differ from female science teachers in the perceptions of the impact of Microsoft products on teaching and learning of science in FCT secondary schools. The results of the research are also in line with the work of Hennessy, Ruthven, & Brindley, (2005) that Lack of adequate ICT equipment and internet access is one of the key problems that schools specifically in rural areas are facing now with insufficiency electricity supply in most of Nigerian communities.

Conclusion

Based on the finding of this study, it could be concluded that Microsoft tools play a vital role in the teaching learning of science subjects in secondary schools across the Federal Capital Territory. The study revealed that Microsoft tools for education provide afforded opportunities to for teachers to create their own information and represent their own ideas in their respective subject areas. Teachers also use Microsoft tools to provide students with learning experiences where they are interacting directly with the computer system which in return enhance the quality of education in the school system.

Recommendations

Based on the findings of the study the following recommendations were made
  i.   Government should embrace Microsoft tools in the education sector to compliment with 21st century global education system.
 ii.   Schools should be provided with well-equipped ICT laboratories for regular professional training for teachers on the use and utilization of ICT in the classroom activities.
iii.   Government should provide enough instructional materials such as PCs, laptops smart mobile phones to help teachers embrace the utilization of ICT.
 iv.   Government should partner with Microsoft company in the areas of teacher professional development training, provision of Microsoft education tools.
  v.   Educational research institutions should also partner with Microsoft for creative and initiative technology sharing

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