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## **Table of Contents**

Decolonising Educational Leadership: Reclaiming Indigenous Epistemologies in Postcolonial African School Governance <b>Babalola, Joel B. &amp; Ayeni, Abiodun Olumide .....</b>	<b>1-16</b>
Conditions of Service and Teacher Effectiveness in Public Secondary Schools in Oyo State, Nigeria <b>Popoola, B. R. &amp; Atanda, A. I.....</b>	<b>17-32</b>
Class Size and Teaching Methodology as Correlates of Students' Achievement in English Summary Writing in Ibadan North-East Local Government Area, Oyo State, Nigeria <b>Aiyede, Evelyn I.....</b>	<b>33-50</b>
Effects of Anxiety and Depression on the Psychosocial Wellbeing of Adolescents in Selected Secondary Schools in Ibadan North Local Government Area, Oyo State <b>Adebowale, Titilola A. &amp; Oyekola, Victoria A. ....</b>	<b>51-72</b>
Relevance of Employability Skills to Undergraduate Career Path across Disciplines in Nigerian Institutions <b>Falaye, Folajogun V.; Adedeji, Segun O.; Okwilagwe, Eugenia A.; Adeleke, Joshua O.; Nghargbu, Rifkatu &amp; Oderinwale, Titilope.....</b>	<b>73-94</b>
The Impact of Accreditation in Maintaining Educational Standards in Higher Education: A Global Perspective <b>Angwaomaodoko, A. Ejuchegahi .....</b>	<b>95-110</b>
Quality Assurance in School System: A Necessity, Not Option in Nigeria <b>Ayinde, Yusuf Adisa; Saleman, Mashood Warrah &amp; Adebayo, Sherifat Shola .....</b>	<b>111-119</b>

Inclusive Education in Gombe State Public Primary and Secondary Schools: Parameters for Learners with Special Needs <b>Ayoola, Olubunmi Adedunke; Ozoekwe, Ifeoma Veronica &amp; Babatunde, Adenjolaoluwa Adedotun .....</b>	<b>120-136</b>
Emotional Stability, Gender and Academic Performance of Secondary School Students with Learning Disabilities <b>Eniola, M.S. &amp; Feyisetan, Christianah Toyin .....</b>	<b>137-148</b>
Managing Lecturers' Academic Impropriety in an Era of Artificial Intelligence for University Education Goals Attainment in Rivers State <b>Igbinedion, Doye Angela .....</b>	<b>149-165</b>
Management of Students' Personnel Services and Goal Attainment in Public Secondary Schools in Cross River State, Nigeria <b>Okoi, I. I. &amp; Etowa, E. G. ....</b>	<b>166-180</b>
Effectiveness of Discovery, Discussion and Lecture Methods of Teaching Social Studies in Delta State Primary Schools, Nigeria <b>Otobo, Janet Tivere &amp; Ukutegbe, Samuel Oroghenemudiake.....</b>	<b>181-203</b>
Influence of Students' Time Management Practices on Academic Performance and Self-Efficacy in Kenyan Higher Education Institutions <b>Ouru, John Nyaegah .....</b>	<b>204-219</b>
Knowledge and Perspective of Secondary School Students towards Legalisation of Abortion: Implication for Counselling the Youths <b>Oyundoyin, Bolanle M.; Akinyele, Osemeiasoh A. &amp; Olanrewaju, Damilola R.....</b>	<b>220-236</b>

- Influence of Class Size and Teacher Classroom Behaviours  
on Secondary School Students' Academic Achievements  
in Biology in Ibadan Metropolis, Oyo State, Nigeria  
**Salako, Toluwalase Glory & Ige, Temisan Angela ..... 237-255**
- Transportation Challenges and Hostel Conditions as  
Determinants of Undergraduates' Academic  
Performance in Federal Universities in Nigeria**  
**Adelowokan, Olusogo A. & Ipingbemi, Olusiyi..... 256-271**
- Study Habit as a Predictor of Academic Motivation among  
Senior Secondary School Students in Southwest Nigeria  
**Adepoju, Adewumi Adeoye & Pitan, Oluyomi Susan ..... 272-286**
- STEM Teachers' Disposition toward Reflective  
Practice Training Programme and Its Effect on  
Their Professional Development  
**Agoro, Aminat Aderonke & Oyediran, Akinloye Moses,  
Adeboye, Olubunmi Omolara ..... 287-299**
- Management of Co-Curricular Activities as Predictor of  
Students' Academic Achievement in Secondary  
Schools in Cross River State, Nigeria  
**Ategwu, Patrick Ogar; Isong, Blessing Edet &  
Emmanuel, Daniel Slaa..... 300-315**
- Supervision of Instruction as Correlates of Teachers Classroom  
Performance in Secondary Schools in Ekiti State  
**Adeleke, Foluso Florence; Ayodele, Olawumi Victoria &  
Bamikole, Oloruntoba Ige ..... 316-326**
- Community Participation in Forest Conservation and its  
Implications for Human Security in Nigeria  
**Ebire, Matthew Olusola; Adeniyi, Israel Ademola;  
Agbonifo, John ..... 327-341**

Leveraging Artificial Intelligence for Personalized Learning and Academic Support in Higher Education in Selected Higher Education Institutions in South-West Nigeria <b>Ojarotade, Segun</b> .....	<b>342-359</b>
Nepotism within the Public Sector in Nigeria <b>Akhere, Stephen Lazi</b> .....	<b>360-375</b>
Assessment of Training Materials, Students' General Knowledge and Acquisition of Practical Skills in Senior Secondary Schools Catering Craft Practice in Ogun State <b>Oduntan, Olusola G.</b> .....	<b>376-391</b>
Influence of Artificial Intelligence on Teaching Effectiveness <b>Ajasa, F.A. &amp; Okemakinde, T.</b> .....	<b>392-404</b>
In a Multicultural Society, <i>are Youths Naturally Aggressive and Violent?: Stakeholders' Assessment of Violent Behavioural Causations among Youths in Ese-Odo Local Government Area of Ondo State</i> <b>Omoniyi, Timilehin Olayinka &amp; Adika, Christiana Adedoyin</b> ....	<b>405-425</b>
Harnessing Artificial Intelligence for Building Sustainable Creativity in Education in the 21 <sup>st</sup> Century <b>Adeyemo, Adekola Oyebamiji &amp; Isola, Fausat Aderonke</b> .....	<b>426-446</b>
Impact of Transformational Leadership Practices on Teachers' Performance and Student Academic Outcomes in Nigeria Secondary Schools <b>Ifiora Nancy ifeyinwa</b> .....	<b>447-462</b>
Social Mobility and Further Education Intentions of Self-Sponsored Students in Public Universities in Rivers State <b>Amaewhule, Eliphaletphebe C.</b> .....	<b>463-477</b>
Involvement in Yahoo-Yahoo and Learning Outcomes among Students in Colleges of Education South Western, Nigeria <b>Afolabi, Anifat Abiodun &amp; Wahab, Issa</b> .....	<b>478-496</b>

Global University Rankings and Nigerian Higher Education: Implications, Challenges, and Opportunities <b>Akintola, Ismaila Akinbode; samotu, Basheer Olalere &amp; Muhammed-Lawal, Adam Adesina .....</b>	<b>497-509</b>
Influence of School Resource Management on Teacher Performance in Public Secondary Schools in Oyo State, Nigeria <b>Oni, Lawrence Adedayo; Salami, Muideen Oladeji &amp; Oparinde, Olayiwola Raheef .....</b>	<b>510-525</b>
School Factors as Predictors of Anxiety Disorder among Learners with Hearing Impairment in Ibadan, Oyo State, Nigeria <b>Adejumobi, Foyinsayemi Lois: Oyewunmi, Adebomi M. &amp; Ogunniyi Lawrence Olumide .....</b>	<b>526-540</b>
<b>Volume 26, No. 2, December 2025 .....</b>	<b>541</b>
Leadership Typologies for School Managers: Aligning Leadership Styles with Management Functions <b>Babalola, Joel B. ....</b>	<b>543-548</b>
School Physical Facilities as Correlates of Teacher Effectiveness in Public Secondary Schools in Osun State, Nigeria <b>Oni, Lawrence Adedayo &amp; Odunlami, Adedayo Adeniran .....</b>	<b>549-565</b>
Early Childhood In-Service Teachers’ Knowledge of the Use of Digital Learning Technology in Ibadan Metropolis, Oyo State, Nigeria <b>Ogunniyi, Lawrence; Adewuyi, Maryam &amp; Ezima, Ebubechi Praise .....</b>	<b>566-579</b>
Influence of Principal Supervision and Resource Availability on Teacher Performance in Oyo State Secondary Schools <b>Oni, Lawrence Adedayo; Salami, Muideen Oladeji &amp; Oparinde, Olayiwola Raheef .....</b>	<b>480-594</b>

- Teacher-Student Relationship and Academic Performance  
of Public Secondary School Students in Akinyele Local  
Government, Oyo State  
**Ala, Mary Adetola; Raji, Ismail Adesina &  
Sanni, Adewale Babajide..... 595-611**
- Teachers' Self-Efficacy, Identity and Secondary School  
Students' Achievement in Quantitative Analysis in Chemistry  
in Different Local Government Areas in Oyo State, Nigeria  
**Idika, Mabel Ihuoma; Odoh, Angela Onyinyechukwu &  
Alese, Tolulope Olubukanla..... 612-625**

**EARLY CHILDHOOD IN-SERVICE TEACHERS' KNOWLEDGE OF THE USE  
OF DIGITAL LEARNING TECHNOLOGY IN IBADAN METROPOLIS,  
OYO STATE, NIGERIA**

**<sup>1</sup>Ogunniyi, Lawrence; Adewuyi, Maryam & Ezima, Ebubechi Praise**

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**Abstract**

Digital technology has progressively become an important feature of the 21st century early childhood classroom instructional strategy. Sadly, most Nigerian teachers especially those teaching at the early childhood levels are not that digitally literate. This shows that early childhood teachers need the knowledge pertinent for the effective use of digital technology. It is against this background that this study explored early childhood teacher's knowledge of the use of digital technology in the classroom.

The study adopted descriptive survey research design. The study covers ten (10) public schools and 10 private schools which were randomly selected from Ibadan North Local Government Area. From each of the schools, Five (5) teachers were purposively selected as the primary teachers available. One (1) research instrument was used: Early childhood teacher's knowledge of the use of digital learning technologies questionnaire. Data was analyzed using frequency count, percentage, mean, standard deviation

Findings revealed that teachers' knowledge of the use of digital technology was high (Mean Average =3.43). Findings also shown that teachers are familiar and often use digital technology such as computer, laptop, learning management system (LMS), multimedia lessons to teach in the class. Struggling to adapt to modern and innovative ( $\bar{x}$  =2.66), smart board ( $\bar{x}$  =2.45), government policies ( $\bar{x}$  =3.16), Culture ( $\bar{x}$  =3.39), Insufficient funds ( $\bar{x}$  =3.58), self-efficacy and proficiency ( $\bar{x}$  =2.86), rapid changes in technology tools ( $\bar{x}$  =2.65), access to relevant technology tools ( $\bar{x}$  =2.61) were the challenges to the use of digital technology.

Teacher's knowledge of digital technology affected their usage of digital learning technologies in the classroom. It was recommended that teachers should continue to update their knowledge about the usage of various digital learning technologies. Also, school administrations should make provisions for effective use of digital learning technologies.

**Keywords:** In-service teachers, Knowledge of the use of digital learning technology, Early childhood

### **Introduction**

Early childhood education is the initial stage of organized instruction designed primarily to introduce young children to a school-type environment. It serves as a bridge between the home and the school. Federal Republic of Nigeria in its National Policy on Education (FRN, 2013) conceptualises it as the education given to children in an educational institution prior to their entering into primary school. Children at this level of education are digital natives. Obiweluzo, Onwurah, Oraelosi, Uzodinma, and Dike (2021) asserted that children born into a digital world where the web, podcast and Google are basic vocabulary words require a high level of engagement in their learning to survive and succeed. They read, write and think digitally. Thus, provision of digital technology in the classroom is vital to support teaching and learning of science engineering and technology activities. For instance, Digital technology can also be used as a scaffolding tool in the early childhood classroom. Digital cameras can be used to create literacy activities for the children. These digital cameras can also be used to document children's learning; daily documentation, wall displays, portfolios (Khodabandeh, 2022). They can be used to create electronic books, child-created books among others. Digital technology enables children to use Google Earth, an online resource to virtually visit a location they have been learning about. Therefore, integrating technologies in learning puts a great role on the teacher as it plays a critical role in the effective use of digital technologies in early childhood classroom.

Digital technology has progressively become an important feature of the 21st century early childhood classroom instructional

strategy. Digital technology refer to electronic gadgets such as handsets, electronic toys, robots, SMART boards video machines, projector, and applications such as zoom, WhatsApp and internet used for dissemination of information and for teaching and learning in schools (Obiweluozo, Onwurah, Oraelosi, Uzodinma, and Dike, 2021). These electronic tools, systems, devices and resources generate, store, or process data in pictures, audio and video forms. The easy access to digital learning technology has transformed every aspect of human life, particularly in the area of teaching and learning. A growing trend today is that children have become technologically exposed daily in areas such as gaming, play toys, phones, computers, television, and videos at home and outside the home (Erna, Risma, Fadel, and Titin, 2022; Khodabandeh, 2022; Okwor, and Taiwo, 2021). Sadly, most Nigerian teachers especially those teaching at the early childhood levels are not that digitally literate (Obiweluozo, Onwurah, Oraelosi, Uzodinma, and Dike, 2021). If Nigerian children must survive and succeed with increasing roles of digital technologies required in fourth industrial revolution era that is significantly becoming part of our culture at home, school, and in their immediate environment, digital learning should be an integral part of learning in the early childhood curriculum and teacher training programmes. Morrison (2012) listed some commonly used digital technologies in early childhood programme to include computers, educational robots, mobile devices like smart phones, tablets, smart boards, the internet, cameras, iPhones, iPads, digital cameras, online games, social media, mobile phones multimedia and many types of assistive technology. These devices have been progressively applied in early childhood classroom learning particularly in developed countries.

Robotics is a digital learning tool that lays the foundation for programming and computational science at the early childhood level. Lerch (2018) defines educational robotics as programmable machines or gadgets that is used in performing a range of tasks by executing input commands. It is programmed to move, make noise, light up, and follow instructions as directed. In the early childhood school setting, educational robots enhance children's problem-solving, creative thinking, and a healthy sense of competition that drives innovation from learners. It is an interesting way to bring early childhood learning to life for young children. It encourages experimentation, teamwork,

problem-solving and knowledge application and tech use in the simplest possible form (DriveMind Group, 2018).

Another digital learning tool is the internet. The internet is network of global computers interconnected to each other and available to any individual. Uses of the internet includes communication, teaching, learning, dissemination of information, basic processes, operating system basics, software installation, media, and so on. Early childhood school teachers appear to lack the internet usage skills. Katnison (2006) observed that most teachers lack the competencies in the use of information technologies to procure, process, store, print, and retrieve information from the computers and internet. Palaiologou (2016) seems to support this view when he asserted that early childhood teachers lack digital and technology knowledge and related skills to use digital technology.

The Federal Republic of Nigeria (2013) defines the teacher as an individual that has been professionally trained in any teacher education programme such as from the Colleges, Universities or institutes of Education. Early childhood teachers however, receive special training to teach young children. Morrison (2012) sees early childhood teachers as professionals who successfully teach all children, promote high professional standard and continually expand their skills and knowledge. In order to meet the demand of digital technology in early childhood classroom, teachers need to possess digital competence. That is: knowledge, skills and attitude in using digital equipment to deliver classroom learning outcomes. For teachers, knowledge in the use of digital technologies involves the ability to utilize presentation skills, educational robotics skills, internet usage and all other digital related skills effectively to perform various activities inside and outside the classroom. This shows that early childhood teachers need the knowledge pertinent for the effective use of digital technology in a play-based manner in the classroom to allow children perform tasks, solve problems, communicate, collaborate as well as create contents. However, a lot of teachers need to discover how to utilize these technologies. It is against this background that this study explored early childhood teacher's knowledge in integrating digital technology in the classroom.

**Research Questions**

1. What is the knowledge of in-service teachers on the use of digital learning technology in early childhood classroom?
2. What are the digital learning technology used by early childhood education teachers in the classroom?
3. What are the challenges faced by early childhood teachers in the use of digital learning technology in early childhood classroom?

**Methodology**

In order to achieve the main objective of this project, which was to examine in-service teacher's knowledge of the use of digital learning technology in early childhood classroom in Ibadan metropolis, it was natural to obtain first-hand information on the state of early childhood by applying a descriptive survey research design. The study population comprised ten public and ten private primary school in Ibadan north local government area. Simple random sampling technique was used to select one local government area in Ibadan metropolis. Random sampling technique was used to select 10 public and 10 private primary schools, from each of the schools, 5 teachers were purposively selected from each school. This selection was based on the fact that the teachers to be selected were those who teach pre-primary, as well as primary one to four. Early Childhood in-service teacher's knowledge of the use of digital learning questionnaire was the instrument used. The scale has a four likert format response: strongly agree, agree, disagree, and strongly disagree. Two sample item included: knowledge of the use of digital learning technologies and challenges faced by teachers in using digital learning technologies. It was rated on a 4 likert scale of 'strongly agree' (4), 'agree' (3), disagree '(2) and 'strongly disagree' (1). Three weeks was used for data collection. Descriptive statistic of frequency count, percentage mean and standard deviation was used to analyse the research question.

## Findings

**Research Question 1:** What is the knowledge of in-service teachers on the use of digital learning technology in early childhood classrooms?

**Table 1: Knowledge of the use of digital learning technologies.**

S/N	STATEMENT	SA	A	D	SD	Mean	Std.D
1	Television can be used to teach children different concepts adequately.	49 (49.5)	48 (48.5)	2 (2)	-	3.47	.541
2	Smart boards can be used to facilitate digital literacy in children.	29 (29)	64 (65)	4 (4)	2 (2)	3.21	.611
3	Allowing pupils to interact with software on the computer or laptop can improve their academic performance.	35 (35.4)	56 (56.6)	5 (5)	3 (3)	3.24	.686
4	The interactive whiteboard can be used to facilitate the learning of children.	44 (44.9)	51 (52)	3 (3.1)	-	3.42	.555
5	Video conferencing allows children to interact with their teachers and peers.	48 (49)	45 (45.9)	5 (5.1)	-	3.44	.593
6	Children can be given class activities using the learning management system with the support of the teacher.	57 (57.6)	39 (39.4)	-	3 (3)	3.52	.660
7	Virtual field trips can improve the learning experience of children.	38 (38.4)	57 (57.6)	4 (4)	-	3.34	.556
8	Children build an awareness of time through the use of digital classroom calendars in the classroom.	58 (60.4)	38 (39.6)	-	-	3.60	.492

9	Multimedia lessons allow children to learn through the use of pictures and words.	74 (77.1)	21 (21.9)	1 (1)	-	3.76	.453
10	Gamified learning helps to facilitate problem-solving and critical thinking in children.	36 (36.6)	58 (58.6)	1 (1)	1 (1)	3.34	.559
<b>Weighted Mean</b>						<b>3.43</b>	

*"SA = Strongly Agree", "A = Agree", "D = Disagree", "SD = Strongly Disagree"*

*Decision Value 0.00-2.44 = Low Extent, 2.45-4.00 = High Extent*

The table 1.0 shows that the level of in-service teacher's knowledge on the use of digital learning technology is high (Weight Average = 3.43). As shown in the table, the teacher's knowledge of the use of digital learning technologies is as follows: teaching with television ( $\bar{x}$  =3.47), smart board for digital literacy ( $\bar{x}$  =3.21), interacting with computer software ( $\bar{x}$  =3.24), interactive whiteboard for learning ( $\bar{x}$  =3.42), children interacting with video conferencing ( $\bar{x}$  =3.44), class activities using the learning management system ( $\bar{x}$  =3.52), virtual field trips for learning ( $\bar{x}$  =3.34), using digital classroom calendars ( $\bar{x}$  =3.60), Multimedia lessons with pictures and word ( $\bar{x}$  =3.76), problem-solving and critical thinking with gamified ( $\bar{x}$  =3.34).

**Research Question 2:** What are the digital learning technologies used by early childhood in-service teachers in the classroom?

**Table 2: Digital learning technology used by early childhood education teachers**

S/N	STATEMENT	YES	NO
1	Computer	92 (94.8)	5 (5.2)
2	Tablets	36 (37.1)	61 (62.9)
3	Laptop	76 (78.4)	21 (21.6)
4	Smart Boards	21(21.6)	76 (78.4)

5	Interactive white Board	37 (38.5)	59 (61.5)
6	Learning Management System	67 (69.1)	30 (30.9)
7	Video Conferencing	21 (21.6)	76 (78.4)
8	Virtual Field Trips	20 (20.8)	76 (79.2)
9	Multimedia Lesson	59 (60.8)	38 (39.2)
10	Digital Classroom Calendar	57 (59.4)	39 (40.6)

Table 4.3 shown the digital technology used by the teachers. This indicates that some teachers do not use some digital technology or they are not aware of some of these digital technologies. Thus, the digital technology used by the teachers was: computers (94.8%), laptops (78%), learning management systems (69.1%), multimedia lessons (60.8%), and digital classroom calendars (59.4%).

**Research Question 3:** What are the challenges faced by early childhood teachers in the use of digital learning technology in early childhood classrooms?

**Table 3: Challenges faced by the teachers in using digital learning technology**

S/N	STATEMENT	SA	A	D	SD	Mean	Std.D
1	I often struggle with adapting to modern and innovative pedagogical approaches.	16 (16.8)	34 (35.8)	42 (44.2)	3 (4.2)	2.66	.794
2	My beliefs often impede my practical use of digital technology in the classroom.	9 (9.3)	28 (28.9)	58 (59.8)	2 (2.1)	2.45	.693
3	I struggle to incorporate technology into my classroom practice.	5 (5.3)	15 (15.8)	72 (75.8)	3 (3.2)	2.23	.592

4	Culture affects the use of digital learning technology in the classroom.	4 (4.1)	22 (22.7)	69 (71.1)	2 (2.1)	2.29	.577
5	Government policies affect the use of digital learning technology in the classroom.	30 (31.3)	53 (55.2)	11 (11.5)	2 (2)	3.16	.701
6	Culture affects the use of digital learning technology in the classroom.	42 (43.8)	51 (52.1)	3 (3.1)	1 (1)	3.39	.605
7	Insufficient funds can also affect the use of digital learning technology.	58 (59.8)	37 (38.1)	2 (2.1)	-	3.58	.537
8	I often struggle with technology self-efficacy and proficiency.	11 (11)	63 (64.9)	21 (22)	2 (2.1)	2.86	.629
9	I often struggle with keeping up with rapid changes in technology tools.	9 (9.3)	47 (48.5)	39 (40.2)	2 (2)	2.65	.678
10	I struggle with access to the relevant technology tools.	8 (8.2)	47 (48.5)	38 (39.2)	4 (4.1)	2.61	.701
<b>Weighted Mean</b>						<b>2.79</b>	

**Key:** "SA = Strongly Agree", "A = Agree", "D = Disagree", "SD = Strongly Disagree"

The result in table 3 shows that teachers faced some challenges when using digital learning technology. As shown in the table, the challenges faced by the teachers in the use of digital learning technologies includes: struggling to adapt to modern and innovative ( $\bar{x}$  =2.66), smart board for digital literacy ( $\bar{x}$  =2.45), Digital technology affected by government policies ( $\bar{x}$  =3.16), Culture affects the use of digital learning technology ( $\bar{x}$  =3.39), Insufficient funds ( $\bar{x}$  =3.58), self-efficacy and

proficiency ( $\bar{x}$  =2.86), rapid changes in technology tools ( $\bar{x}$  =2.65), access relevant technology tools ( $\bar{x}$  =2.61).

### **Discussion of Findings**

#### **Knowledge of in-service teachers on the use of digital learning technologies**

The findings of the research showed that the extent of teachers' knowledge of the use of digital technology was high. Teacher's knowledge of the use of digital learning technologies was based on teaching with television, smart board for digital literacy, interacting with computer software, interactive whiteboard for learning, children interacting with video conferencing, class activities using the learning management system, virtual field trips for learning, using digital classroom calendars, Multimedia lessons with pictures and word, problem-solving and critical thinking with gamified. This meant that, the teachers were aware that digital learning technology enhanced learning and helped pupils explored and also improved their academic performance. This was at variance with the findings by Saikkonen and Kaarakainen (2021) in the teaching profession, digital literacy skills are the core competency requirement for teachers whose basic duties included searching, processing, and sharing information. The findings also revealed that teachers were familiar with digital technology tools such as: computer, laptop, learning management system (LMS), multimedia lessons and often used them to teach in the class. This was in agreement with Alobaid (2020) who was of the opinion that incorporating digital technology tools created a more engaging and interactive learning environment that catered for diverse learning needs of the pupils.

#### **Digital learning technologies used by teachers in the classroom**

The findings of the research study revealed that teachers were familiar with digital technology tools such as computer, laptop, learning management system (LMS), multimedia lessons and often used them to teach in the class. This was in agreement with Alobaid (2020) who was of the opinion that incorporating digital technology tools created a more engaging and interactive learning environment that catered for diverse learning needs of the pupils. Khodabandeh(2022) opined that

learning technologies such as digital cameras can also be used to document children's learning; daily documentation, wall displays, portfolios. But Obiweluzo, Onwurah, Oraelosi, Uzodinma and Dike (2021) submitted that digital technology referred to electronic gadgets such as: handsets, electronic toys, robots, SMART boards video machines, projector, and applications such as zoom, WhatsApp and internet used for dissemination of information and for teaching and learning in schools. Also, Morrison (2012) listed some commonly used digital technologies in early childhood programme to include computers, educational robots, mobile devices like smart phones and tablets, smart boards, the internet, cameras, iPhones, iPads, digital cameras, online games, social media, mobile phones multimedia and many types of assistive technology.

#### **Challenges faced by the teachers in using digital learning technology**

The result showed that teachers faced some challenges when using digital learning technology. The challenges faced by the teachers in the use of digital learning technologies includes: struggling to adapt to modern and innovative, smart board, government policies, culture, insufficient funds, self-efficacy and proficiency, rapid changes in technology tools, access to relevant technology tools. This was in line with Peterson et al. (2018) who submitted that many ECE teachers struggled with adapting to modern and innovative pedagogical approaches because of their inherent convictions and beliefs. Ward (2013) also believed that there are various reasons for the lack of usage of digital technology in the ECE, which included: culture, government policies, funding, inequalities and lack of adult guidance.

#### **Conclusion**

From the findings of the study, it was observed that early childhood in-service teachers have the basic knowledge of the use of digital learning technologies. The teachers are aware of digital learning technology tools which could improve teaching and learning activities in the classroom. They are familiar with digital technology tools such as computer, laptop, learning management system (LMS), multimedia lessons and often use them to teach in the class. However, struggling to adapt to modern and innovative, smart board, government policies, culture, insufficient funds, self-efficacy and proficiency, rapid changes

in technology tools, access to relevant technology tools are some of the problems still plaguing teachers knowledge of the use of digital technology.

### Recommendations

Based on the findings, the following recommendations were made:

1. Teachers should continue to update their knowledge on the use of various digital learning technologies.
2. School administration should make provision for teachers to utilize digital learning technologies in the classroom.
3. The school should organize constant training for teachers to guide them on the use of various digital learning technology tools.

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