DIGITAL TECHNOLOGY IN CHILDHOOD INSTRUCTION: FRIEND OR FOE? CHILDHOOD TEACHERS' PERSPECTIVE IN MINNA, NIGER STATE

[1]Yaki, Akawo Angwal.[2]Midat, Caroline Yunana.[3]Babagana, Mohammed.[4]Nmadu, John

[1&3]Federal University of Technology Minna, Department of Science Education,
[2]Nigerian Institute of Leather and Science Technology (NILEST)
Zaria, Kaduna State, Nigeria.
[4]Alex Ekwueme Federal University Ndufu-Alike Ikwo, Ebonyi State
Department of Science Education
[1]Corresponding Author: yakiakawo@gmail.com

Abstract
There is a consensus among researchers and educational stakeholders on the potential of technology to enhance meaningful and lifelong learning. Nevertheless, there is an ongoing debate in childhood education on the positive and negative impacts of technology in children lives. Therefore, this study investigated Digital Technology in Childhood Instruction, Friend or Foe: Childhood Teachers' perspective in Minna, Niger State. A descriptive cross-sectional survey was adopted for this study. All childhood educators in Minna Metropolis form the population of the study. 93 children teachers were selected as the sample size using simple random sampling. Three research questions and one hypothesis guided the study. The data were collected using structured questionnaires on teacher's perceived usefulness, ease of use and behavioural intention to use digital technology for children instruction. The instrument was pilot tested and using Cronbach Alpha, and the instrument yielded a reliability coefficient of between 0.72, 0.70 and 0.74. The data were analysed using Mean, Standard Deviation and independent t-test. The findings of the study showed that childhood educators perceived digital technology to be useful for children instruction; their perceived ease of use and behavioural intention to use was also positive. The result also indicated that there is no significant difference in the perceived usefulness between male and female teachers. It was concluded that digital technology is perceived as a friend and not a foe among the population. It was recommended among others that digital technologies and enabling environment to be made available for children instruction.

Keywords: Digital Technology,Behavioural Intention, Childhood Educators, Perception, Ease of Use, and Perceive Usefulness

Introduction

Technology is an indispensable tool for meaningful learning. Therefore, educators at all levels of education must leverage it to create a classroom environment that is motivating, engaging and personalised to meet the needs of the present generation of learners who are digital natives. Digital technology-enhanced instruction offers numerous learning benefits because it is characterised by images, sounds, graphics, text and animation, which could attract and sustain students learning lifespan. It also enhances learners' interaction and supports a non-linear way of teaching and learning. This non-linear method of instruction provides the learner with the opportunity to take control of his/her learning and enables them to explore the learning content effectively.

Nevertheless, there is a debate on the use of digital technologies for children instruction. Proponents for the integration of these devices for children learning believed that it enhances learning, and creativity (McKenney & Voogt, 2010; Nikolopoulou & Gialamas, 2013). On the other hand, the opponents of the integration believe that the use of digital technologies for children learning will inhibit learning and has a negative influence on their development. Therefore, teachers' perception of technology use, is a fundamental variable that could impact positively or negatively on the integration of technology for classroom instruction.

Perceive usefulness is the extent to which an individualbelieves that using a particular device, system or technology will impact positively on their job performance.Chen and Lishing-Hang (2011)reported that perceived usefulness positively influences an individual's attitudes towards utilisation of

technology or a new product. All instructional contents are built or structured with specific skills and competencies to be acquired and to acquire these learning objectives, instructional activities, materials (graphics, videos and devices) and methodology are carefully selected.Given that, digital devices are essential materials that can enhance learners' engagement and meaningful learning.Barclay and Osei-Bryson (2012) opined that perceived usefulness has an influence on an individual behavioural intention. Worthy of note is that an individual predisposition towards a device could be good or bad, positive or negative. That could make the device a friend or foe.Nikolopoulou and Gialamas (2013) highlighted teachers' negative perception as barriers to the implementation of digital devices in early childhood education. On the other hand, Hermans, Tondeur, Van Braak, and Valcke (2008)reported teachers' positive perception and attitude towards the usage of digital devices for instruction.Perceive ease of use of a device, technology or system explains the magnitude/ extent in which an individual perceives the device to make teaching and learning easier. Even though most technological devices are user-friendly, individual perception of it can also make it looks difficult to use and could lead to a lack of self-efficacy. Perceive ease of use on digital technology has a direct influence on an individual's perceived usefulness(Kaplan & Haenleain, 2010). It is reported that technology use positively enhanced teaching and learning(Kaplan & Haenleain, 2010; Naven, 2017).

Behavioural intention is attitudes towards use. It is ones' belief (positive or negative) about using a device, system or technology. It is the predisposition of an individual towards a given object/ device which is influenced by an individual perceive usefulness and ease of use(Alharbi & Drew, 2014). Therefore, children teachers' perception of digital technologies could influence their utilisation or rejection of digital devices. Therefore, in the case of utilisation, digital technology could be a friend, but in the case of rejection, digital technology could be a foe.Chang and Tung (2008) conducted a study to examine students' behavioural intention to use new technology. The findings indicated that an individual's teachers perceived ease was positive and had a positive influence on behavioural intention. Gender is considered as a moderating variable in this study.

The theory that provides supports for this study is the Diffusion of Innovation Theory (Rogers, 1995). This theory explains how a group of people could be exposed to the same information but could respond differently. Put in another way; it is an explanation of the likelihood of an individual in a society to accept a new idea, technology or product. Therefore, to accept or reject an idea is control by an individuals' perception which is influenced by several factors(Rogers, 1995). This theory focused on the process in which an individual accepts communication or innovation or findings among a given culture. The theory highlighted the process of awareness, interest, assessment and utilisation of a product (digital technology). In this study, the children teachers view of Digital Technologies as a friend or foe will largely depend on factors such as awareness and perception (perceive usefulness, perceive ease of use)Others include; interest and attitudes (behavioural intention), whether these teachers have a positive or negative behavioural intention to use digital technology. Those who have a positive interest may adopt it for instruction, while those who have negative persuasion and perception may not adopt or use digital technology for children learning.
Digital technology in this study is broadly defined to include portable computers, electronic books, digital toys, mobile phones, portable computers, video games and desktop, among others. In other words, digital devices in this study refer to all products bought and integrated for children's learning. Children teachers are those who teach children between 2-11 years old.

Statement of the Problem

Government and researchers recognised that the successful implementation of educational policies and innovations is mostly dependent on the classroom teacher (Nikolopoulou & Gialamas, 2013). In support of this Obielodan, Amosa, Ala, and Shehu (2019) observed that the integration of technology into teaching and learning is affected by the teacher. Consequently, teachers' belief, attitudes and perception of these digital devices in children learning could influence their usage. Hence an important question could be, is a digital technology for children learning a friend or foe? In Nigeria, the use and possession of some these devices in school by children is seen to have a positive impact. For instance, in most public secondary schools in Nigeria, students are punished if found in the possession of some digital devices such as phones notepad, computers and audio players among others.

Thus, the fast-changing landscape of educational technology requires continued attempts to measure teachers' perspectives on technology usage. Furthermore, given that early childhood educators are still the primary gatekeeper to young children's technology use for learning. It is critical to understand what influence these teachersuse of technology. This could help us understand the return on investment that could be expected from technology-enhanced learning. However, the majority of studies that investigated teachers' perception and attitudes on technology focused on teachers of adult children and computer technology only (Obielodan et al., 2019; Teo, 2014).

Consequently, by assessing children teachers' perspectives of the usefulness of digital technologies, the findings will help to create awareness of the need for enabling policies and friendly environment for the integration of digital technologies. Hence, this study investigated Digital Technology in Childhood Instruction: Friend or Foe? Childhood Teachers' Perspective in Minna, Niger State. Specifically, the objectives of this study determined; children teachers' perceived usefulness, ease of use and behavioural intention to use digital technology.

Research Questions

To achieve the objectives, the following research questions were raised:

1. What are children-teachers perceive usefulness on digital technology for children instruction?
2. What are children-teachers perceive ease to use digital technology for children instruction?
3. What is the behavioural intention of children teachers to the use of digital technology for children instruction?

Research Hypothesis

$H0_1$: There is no significant difference in the behavioural intention of male and female children teachers towards the use of digital technology for children instruction.

Research Methodology

The study adopted a descriptive (cross-sectional) survey design. The descriptive design in this study involves the use of a quantitative approach to gathering data (Creswell, 2012). The population of the study is made up of all children teachers in Minna Metropolis, Niger State. A multi-stage sampling procedure or approach was used in selecting the respondent for this study. First, the stratified sampling technique was employed to divide Minna Metropolis into two strata; BossoLocal Government and ChanchagaLocal Government. Five schools were randomly selected from each local government and all the children-teachers chosen from the schools were used the study. The sample size was made up of 93 children-teachers; 32 of the children were from the private school, and 61 were from government institutions. The sample size was also made up of 51 female teachers, and 42 were male teachers.

The instrument for data collection wasadopted structured questionnaire. The questionnaire is a 5-point Likert- scale of Strongly agree (5) Agreed (4) Undecided (3) Disagree (2) and Strongly disagree (1). The instrument was made up of section A, B and C. Section A is made up of respondent demographic data, Section B is made up of 10 items that sought to determine children teachers' perception towards digital technology for children instruction.Section C consists of 7 items that sought to determine children teachers' behavioural intention towards the use of digital technology for children instruction. Similarly, section D consists of 5 items that sought to determine children teachers' behavioural intention towards the use of digital technology for children instruction. The structured questionnaire was validatedby two educational technology experts, two educational phycologists, 1 English language expert for face and content validity. The instrument yielded areliability coefficient index of 0.72, 0.70 and 0.74 using Cronbach alpha. This agrees with Hair, Black, Babin, and Anderson (2010) who reported that the Cronbach's Alpha reliability value of 0.60 and above is adequate for instruments developed in the field of education and social science.

The data collected were analysed using descriptive and inferential statistics. Research questions were answered using mean and standard deviation while the formulated hypothesis was tested using t-test at 0.05 level of significance. The benchmark for agreeing and rejecting an item and the grant mean was 3.00 and above and less than 3.00 respectively. This was determined using the average mean of a 5-point Likert scale (3.00) (Owodunni, 2019).

Results

The results of this study were presented based on the stated research questions and the formulated hypothesis as displayed below;

Research Question 1; What are children-teachers perceive usefulness on digital technology for children instruction? To answer this research question, the mean and standard deviation was employed, and the analysis is presented in Table 1.

Table 1: Mean and Standard Deviation of Children Teacher'sPerceive Usefulness of Digital Technology for Children Instruction

S/No	Items	N	Mean	SD	Decision
1	Digital technology allows the child to develop creative skills	93	3.14	1.06	Agree
2	Using digital technology encourages children participation in achieving learning goals	93	3.26	1.30	agree
3	Digital technologies enrich students understanding of the learning concept	93	3.24	1.20	Agree
4	Digital technology provides children with instant feedback	93	3.80	2.63	Agree
5	Children concentration during learning is enhanced using digital technologies	93	3.48	1.43	Agree
6	Teaching and learning through digital technologies allow children and facilitators to brainstorm on the subject matter	93	3.24	1.35	Agree
7	I have the knowledge to employ digital technologies for children learning	93	3.36	1.41	Agree
8	I can facilitate and monitor children's learning process using digital technologies	93	3.62	2.24	Disagree
9	Digital technologies have negative effects on students learning	93	2.12	1.12	Disagree
10	I feel digital technology is time-wasting and a distraction to the student	93	2.34	1.46	Disagree
	Grand (Mean and Standard Deviation)		3.16	1.41	Agree

Table 1 shows the results of children teachers' perception of the usefulness of digital technology for children instructions. The children-teachers from the population perceive Digital technology to be useful for children instruction. The average mean of 3.0 was the benchmark for agreeing and less than 3.0 for disagree on each item. Consequently, items 1-8 shows the mean of between 3.14 – 3.80, and the grand mean 3.16, indicating that digital technology is perceived as useful for children instruction. The finding of item 9 and 10, which are negative items show that the respondents did not agree that digital technologies have negative effects and are a distraction to children learning. However, the grand mean of 3.16 implies that the respondents have a positive perception of digital technology. The standard deviation of the respondents' perception was between 1.02 - 2.63, while the standard deviation grand mean is 1.41. Indicating that the standard deviation means in the data set are close to the group mean of the data set. This implies that there is no large variations or deviation in the responses of children teachers.

Research Question 2; What are children-teachers perceive ease to use digital technology for children instruction? To answer this research question, descriptive statistics were used, and the result is presented in Table 2

Table 2: Teachers' Perceive Ease of Use of Digital Technology for Children Instruction

S/No	Items	N	Mean	SD	Decision
1	I consider digital technologies as innovation, and I am ready to adopt them for children learning	93	3.32	1.22	Agree
2	My digital technology's knowledge and skills will help me to engage in technology-enhanced learning among children	93	3.26	1.30	Agree
3	I have enough experience to cope with the use of digital technology	93	3.40	1.44	Agree
4	I am prepared to respond to children questions	93	3.34	1.63	Agree

	and inquires on learning with digital technology				
5	With enabling environment, I am ready to engage in digital technology-enhanced learning	93	3.38	1.43	Agree
6	Teaching using digital technology is difficult, I do not seem to like it	93	2.84	0.94	Disagree
7	Utilizing digital technologies distracts me from the objectives of the lesson	93	2.24	1.20	Disagree
8	**Grand (Mean & Standard Deviation)**	**93**	**3.11**	**1.31**	**Agree**

Table 2 shows the results of children teachers perceive ease of digital technology use for children instructions. The teachers from the population perceive digital technology to be easy to use in their classroom. The average mean of 3.0 was used as the benchmark for agreeing and less than 3.0 for disagree on each item. Consequently, items 1-5 shows the mean of between 3.00 and 3.40, and the grand mean 3.16, indicating that digital technology is perceived as easy to use. The findings of item 6 and 7, which are negative items showed that the respondents did not agree that digital technology is challenging to use. However, some respondents in the population do not believe that digital technology is easy to us as shown in item 6 and 7 (2.84 and 2.24 respectively) The standard deviation of the respondents' perception was between 0.94 and 1.63, while the standard deviation grand mean is 1.31. Indicating that there is no meaningful deviation of respondents' perception from each other and the standard deviation mean of the group. Indicating that the standard deviations spread in the data set are close to the group mean of the data set. This implies that there is no large variations or deviation in the responses of children teachers.

Research Question 3; What is the behavioural intention of children teachers to the use of digital technology for children instruction? To answer this research question, the mean and standard deviation was employed, and the result is as presented in Table3.

Table 3 ChildrenTeacher's Behavioural Intention to Use of Digital Technology for Children Instruction

S/No	Items	N	Mean	SD	Decision
1	I consider digital technologies as innovation, and I am ready to adopt them for children learning	93	3.20	1.26	Agree
2	My digital technology's knowledge and skills will help me to engage in technology-enhanced learning among children	93	3.28	1.30	Agree
3	I am willing to serve as a facilitator for children learning using digital technologies	93	3.44	1.20	Agree
4	I am prepared to respond to children questions and inquires on learning with digital technology	93	3.60	1.83	Agree
5	With enabling environment, I am ready to engage in digital technology-enhanced learning	93	3.46	1.43	Agree
	Grand (Mean and Standard Deviation)	93	3.40	1.40	Agree

Table 2 shows the findings of children teachers' behavioural intention to the use of digital technology for children instruction. The average mean of 3.0 was used as the benchmark for agreeing and less than 3.0 for disagree on each item and the grand mean. Consequently, all items show the mean of between 3.20 – 3.60 and the grand mean is 3.40, indicating that all the respondents have the intention to integrate digital technology for children instruction. The standard deviation of the respondents' behavioural intention to the use of digital technology for children instruction was between 1.20 - 1.83, while the standard deviation grand mean is 1.40. Indicating that the standard deviations spread in the data set are close to the group mean of the data set. This implies that there is no large variations or deviation in the responses of children teachers.

Hypothesis one; there is no significant difference in the behavioural intention of male and female children teachers towards the use of digital technology for children instruction. To test the formulated hypothesis, t-test was used, and the result is as presented in Table4.

Table 4: independent t-test Analysis of Male and Female Behavioural Intention to use Digital Technology for Children Learning

Gender	N	Mean	SD	df	t-value	p-value
Male	42	14.27	1.47	91	2.66	0.08
Female	51	11.63	2.24			

Table 4 shows there is no significant gender difference in the behavioural intention to use digital technologies for children instruction $t(91)=2.66$, $p=0.08$ ($p>0.05$). This indicated that hypothesis one, which states that there is no significant difference in the behavioural intention of male and female children teachers towards the use of digital technology for children instruction, is not rejected. The male students mean (14.27) is not significantly higher than the mean of the female (11.63).

Discussion of Results

The findings indicate that children teachers perceive digital technologies to have a critical role in meaningful teaching and learning among children. The findings corroborate with the earlier findings of Teo (2014) and Hermans et al. (2008) who also reported teachers' positive perception of digital technologies for effective teaching and learning among children. This also agrees with Lindahl and Folkesson (2012) who reported that digital technology is an important tool for instruction among children. However, this finding did not correspond with Nikolopoulou and Gialamas (2013) who reported teachers' negative attitudes towards digital technology for teaching which could be attributed to their negative perception

The findings of the study could be attributed to the fact that digital technology has impacted every sector of human endeavours, the education system inclusive. The use of digital devices such as computers, handset and calculators, among others, could help to influence their perception of digitally enhanced-learning among children.

The findings also indicated that digital technology is easy to use for children instruction and the teachers have a positive intention to use digital devices in their classroom. This finding agrees with Davis (1989), who reported ease of use of technology among respondents. The positive ease of use and behavioural intentions observed in the population could be attributed to their perceived usefulness reported earlier. Consequently, Barclay and Osei-Bryson (2012) opined that perceived usefulness influences an individual behavioural intention.

Similarly, the findings of the study also indicate that children teachers have a positive behavioural intention to integrate digital technology for children instructions. This finding concurs with the finding of Alharbi and Drew (2014)who conducted a research study on the use of Technology Acceptance Model to examine academics' behavioural intention to use technology such as learning management systems. The found that respondents' perceived usefulness, perceived ease of use, and behavioural intentions towards technology integration was positive. This finding could be attributed to children teachers perceive usefulness and ease of use of digital technology which could have influenced their intention to integrate technology.

The findings also show that gender does not influence teachers' perception of digital technologies for children instruction. These findings are supported by Obielodan et al. (2019), who reported no differences between male and female teachers' perception of the use of digital technology (blended learning) for instruction. These findings could be attributed to the fact that both male and female teachers are digital natives and digital technologies have become an integral part of their lives (Palfrey & Gasser, 2008). Hence, they have similar perception and behavioural intention to integrate these devices for children teaching and learning.

Conclusion

Digital technology is viewed as a veritable tool that will enhance meaningful learning at all levels of education. Therefore, the quest to integrate digital technology for classroom instruction is at the forefront of educational discourse. Given the findings, it is logical to conclude that digital technology has infiltrated the personal and instructional life of children educators. This was demonstrated by the positive perception and behavioural intention to integrate digital technology for classroom instruction. The teachers of this population perceived these devices to have no negative effects on children education, therefore the view technology as a friend and not a foe. Gender did not play a significant role in respondents' perception, suggesting that irrespective of gender, children teachers have

positive perception towards technology-enhanced learning. Hence, this study provided a theoretical understanding of children teachers perception of digital technology.

Recommendations

Given the findings of this study, the following were recommended;

1. Digital technology is perceived as a friend and not a foe, therefore, for children education should be provided for children-teachers use in their classroom
2. The conducive learning environment and motivation should be provided for children teachers to engage in digital technology-enhanced learning.
3. Workshop and training should be provided on the integration of digital technology by children teachers
4. Motivation and incentives should be provided to encourage children teachers to integrate digital technology

References

Alharbi, S. & Drew, S. (2014). Using the technology acceptance model in understanding academics' behavioural intention to use learning management systems. *International Journal of Advanced Computer Science and Applications,* 5 (1), 143-155.

Barclay, C., & Osei-Bryson, K. M. (2012). *An analysis of students perception and attitudes to online learning use in higher education in Jamaica. An extension of TAM (Research in progress).* Paper presented at the ICIS Conference proceedings.

Chang, S., & Tung, F. (2008). An empirical investigation of students' behavioural intentions to use online learning course websites. *British Journal of Educational Technology, 39*(1), 71-83.

Chen, S. F., & Lishing-Hang, L. (2011). Recent related research in technology acceptance model; A literature review. *Australian Journal of Business and Management Research, 1*(9), 124-138.

Creswell, J. C. (2012). *Educational research planning, conducting, and evaluating quantitative and qualitative research*. Boston MA: Pearson.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS quarterly*, 319-340.

Hair, J. F. J., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7 ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Hermans, R., Tondeur, J., Van Braak, J., & Valcke, M. (2008). The impact of primary school teachers' educational beliefs on the classroom use of computers. *Computers & Education, 51*(4), 1499–1509.

Kaplan, A. M., & Haenleain, M. (2010). Users of the world unite the challenges and opportunities of social media. *Business Horizons, 53*(1), 59-68.

Lindahl, M., & Folkesson, A. (2012). ICT in preschool: friend or foe? The significance of norms in changing practice. *International Journal of Early Years Education, 20*, 422–436.

McKenney, S., & Voogt, J. (2010). Technology and young children: how 4-7-year-olds perceive their own use of computers. *Computers in Human Behavior, 26*(4), 656–664.

Naven, K. S. (2017). Survey analysis on the usage and impact of WhatsApp Messenger *Global Journal of Enterprise Information System, 8*(3), 235-247.

Nikolopoulou, K., & Gialamas, V. (2013). Barriers to the integration of computers in early childhood settings: Teachers' perceptions. *Education and Information Technologies, 20*(2), 285-301.

Obielodan, O. O., Amosa, A. A., Ala, A. A., & Shehu, A. B. (2019). Lectures' perception of the utilization of blended learning for instruction in selected colleges of education in North-East, Nigeria. *Journal of Science, Technology, Mathematics and Education (JOSTMED), 15*(1), 162-169.

Owodunni, M. A. (2019). Classroom management approaches adopted by junior secondary school teachers in Gwagwalada area council of Federal Capital Territory *Journal of Science, Technology, Mathematics and Education (JOSTMED), 15*(1), 176-183.

Palfrey, J., & Gasser, U. (2008). *Born digital: Understanding the first generation of digital natives*. Philadelphia, PA: Perseus Books Group.

Rogers, E. M. (1995). *Diffusion of innovations*. New York: Free Press.

Teo, T. (2014). Taking teachers acceptance technology. Test of measurement variances and latent means different. *Computer and Education, 75*, 125-135.