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Assessment Of Pre-Service Teachers' Perceived Usefulness, Ease of Use and Behavioural Intention to Use ICTs for Mathematics Instruction: A Case Study

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Abstract

The need to enhance mathematics instruction through the use ICTs for improving the performance of students in the subject in Nigeria can no longer be paid lip service. ICTs have proven to be a veritable instrument that can actively engage and improve students' mathematical learning experience. This study examined preservice teachers' perceived usefulness, ease of use and behavioural intention to use ICTs for mathematics instruction in Nigeria. The study adopted a descriptive research design of a survey type and 315 students who enrolled in a college of education to become mathematics teachers were selected through a multi-stage sampling technique. Data was collected through a self-designed questionnaire and the generated data were analysed using frequency counts, simple percentages, mean and standard deviation. Results reveal among others that preservice teachers' perception of the usefulness of ICTs to enhance mathematics instruction is very high. Equally, their perceived ease of use of ICTs for mathematics instruction is high. Power supply, lack of fast internet connection and high fees for internet access were perceived by the preservice teacher as the greatest challenge to the effective use of ICTs for mathematic instruction. The conclusion of the study was therefore drawn based on the results of the study

Keywords: behavioural intention, ICT, mathematics instruction, perceived usefulness, pre-service teachers

A. Introduction

Education as a concept refers to the process of facilitating learning or the acquisition of knowledge, skills, beliefs, values and habits to make people better citizens, capable of contributing meaningfully to the society (UOPEOPLE, 2020; UNESCO, 2022). While the purpose of education varies based on the culture and prevailing yearnings of the people across the globe, education is generally accepted to be the basic building block of every society. It is the single best investment countries can make to build prosperous, healthy and equitable societies (United Nations, n.d.). Education is a powerful agent of change and a fundamental instrument for improving health, livelihoods and contributes to social stability and drives long-term economic

growth (Global Partnership for Education, 2019). According to Itasanmi, Akintolu and Oni (2021), education is a necessary ingredient for the sustainable socio-economic development of any nation. Considering the place of education in national survival, countries of the world continue to strive for different strategies and policy options that may guarantee improvement in the educational attainment of their citizens and how students can achieve high academic outcomes. Achieving a high academic outcome among students has been identified as a predictor of educational success among stakeholders in the education sector (Osborne & Rausch, 2001).

For the general development of any nation and sustenance of educational success, mathematics has a great role to play (Azuka, 2015). The importance and unique place of mathematics among other subjects cannot be overemphasised. Firstly, mathematics is an essential part of human thought and logic, and the basic skills needed to understand oneself and the world we live in. Secondly, mathematics provides an effective way of building mental discipline and encourages logical reasoning as well as mental rigour. Lastly, a sound knowledge of mathematics enables a clearer understanding of the contents of other subjects (International Mathematical Union (IMU), 2017). Describing mathematics as a subject, Golding (2018), pointed out that mathematics is "concerned with the exploration of, and connections between, patterns that often arise from the external world, their abstraction and their relationships as established through reasoning". This, therefore, alludes to the fundamental role of the subject in 21st-century economies (Golding, 2018). According to Agbajor (2013), the bedrock of science implementation and use in Nigeria is based on mathematical education. It was further noted that a rightful delivery of mathematical education to Nigerians could serve as a means of empowerment for both qualitative and quantitative growth and changes that could make the country one of the top twenty best economies in the world (Agbajor, 2013). This thus echoed the emphasis and clamour of education stakeholders and other authorities on the need for students to attain proficiency in computational skills and problem-solving (Yeh, Cheng, Chen, Liao, & Chan, 2019).

Despite the recognition is given to Mathematics as a fundamental subject for many professions, especially science, technology, and engineering and its impact on the learning of other subjects, yet, Mathematics is often perceived as difficult and many students perform very low (Li & Schoenfeld, 2019). Specifically, in Nigeria, it has been observed that students' performance in Mathematics continued to be abysmally low both in the internal and external examinations. Associated factors identified by scholars and practitioners as factors affecting students' performance in Mathematics include shortage of qualified Mathematics teachers, poor facilities, equipment and instructional materials for effective teaching, large student-to-teacher ratios and traditional chalk and talk method (Agbajor, 2013; Alata, 2016; Agah, 2020). According to Sa'ad, Sa'ad, Adamu, and Sadiq, (2014), low academic achievement in Mathematics among school students in Nigeria is caused by understaffing, inadequate teaching/learning materials, lack of motivation and poor attitude by both teachers and students, and retrogressive practices. It, therefore, becomes important to explore avenues that could provide a new kind of support to mathematics instruction to improve some of the conditions resulting in poor performance of students in the subject, especially the teaching and learning process.

The use of Information Communication and Technologies (ICTs) has become a catchphrase in contemporary education. The rapid growth and expansion of ICTs have significantly changed narratives in virtually all human endeavours and have affected the demands of modern societies (Mensah, 2017). Many countries all over the world have continued to push for the full integration of ICTs into education due to the lack of teaching resources and the enablement that ICTs offer. For instance, in the traditional model of instruction, the only available teaching resources are textbooks but with the use of ICT, a new kind of support is given to the teacher to source teaching materials that could either supplement the textbooks or provide a better teaching resource from other parts of the world that is not locally available. Generally, a growing body of evidence demonstrates that ICT is an effective means of addressing education goals and requirements (Flores & Lin, 2013; Guzeller & Akin, 2014; Vanderlinde, Aesaert, & Braak, 2014).

It is not amazing that ICTs, including computer applications, and mobile technology have become essential and highly germane items in teaching and learning in schools in the 21st century. Therefore, the effects of integrating ICT into teaching and learning on students' development have gained more and more attention from both education policymakers and researchers (Luu & Freeman, 2010).

Considering the challenges facing Mathematics teaching and the corresponding effect on students' academic achievement in the subject, it is worthy to explore ICT-supported learning opportunities to fortify student learning. This is based on the documented evidence in support of ICT for enhancing teaching and learning generally and mathematics instruction specifically. Becta (2004) noted that teaching and learning mathematics through the use of ICTs allow students to focus more on strategies and interpretation of answers as against wasting time on boring computational calculations. Also, it has been indicated that using ICTs for mathematics instruction help students to visualise the process better and enhances their understanding of basic concepts. Bora and Ahmed (2018), opined that the use of ICTs to enhance mathematics instruction is a great equalizer (it brings everyone to the same level). ICT takes the low and high calibre students to heights unknown. Thus, it's no gainsaying that integration of ICTs into mathematics instructions can potentially change pedagogical methods radically with the corresponding improvement in students' learning outcomes (Mensah, 2017). Therefore, The need to enhance mathematics instruction through the use ICTs for improving the performance of students in the subject in Nigeria can no longer be paid lip service. ICTs have proven to be a veritable instrument that can actively engage and improve students' mathematical learning experience. However, there is ambiguity on the perceived usefulness, ease of use and behaviour intention of mathematics teachers especially pre-service teachers who are in the best position to re-evaluate the teaching of Mathematics in schools and determine the best methods for procuring higher calibres of Mathematics achievement among the students to use ICTs for mathematics instruction.

While several studies (Moses, Wong, Bakar, & Mahmud, 2013; Ursavas, Bahçekapılı, Camadan, & İslamoğlu, 2015; Perienen, 2020; Ebire, 2020; Mailizar, Almanthari, & Maulina, 2021) on ICT integration into mathematics instruction have mainly focused on in-service teachers, few studies (Teo & Milutinovic, 2015; Wong, 2015; Luik & Taimalu, 2021) exist on pre-service teachers' intention to use ICTs for mathematics instruction. Unfortunately, all the studies on pre-service teachers' behavioural intention to use ICTs for mathematics instruction were conducted outside the shore of Nigeria. This, therefore, create a gap that this study intends to fill by examining pre-service teachers' perceived usefulness, perceived ease of use and behavioural intention to use ICTs for mathematics instruction using a teacher training institution as a case study. Specifically, the study is guided by five research questions. Firstly, what is the level of perceived usefulness of ICT to Mathematics teaching among pre-service teachers? Secondly, what is the level of perceived ease of use of ICTs for Mathematics teaching among pre-service teachers? Thirdly, what is the behavioural intention level to use ICTs for Mathematics teaching among pre-service teachers? Fourthly, which technological tools are perceived to be more useful in Mathematics teaching among preservice teachers? Lastly, what are the perceived challenges in using ICT to enhance Mathematics teaching among preservice teachers?

B. Methodology

1. Research Design

A descriptive research method using a survey design was adopted to investigate pre-service teachers' perceived usefulness, ease of use and behavioural intention to use ICTs for mathematics instruction. The use of a survey in form of a questionnaire for this study was based on the need to have a quantitative picture of the preservice teachers' opinions about the subject matter within a short period. According to Cresswell and Poth (2018), a survey design provides an opportunity for researchers to investigate a subset of the population to generate a quantitative assessment of the population's opinion.

2. Participants

For data collection, 315 participants who enrolled in a college of education to become mathematics teachers were selected through a multi-stage sampling technique. Firstly, a college of education that runs mathematics education in Southwest Nigeria was purposively selected based on having similar characteristics to other teacher training institutions in the country and based on running both undergraduate degree and Nigeria Certificate in Education (NCE) in mathematics education. Secondly, a stratified random sampling technique was used to select the participants according to their type and level of the programme. Lastly, simple random sampling was used to select 50 participants from each stratum (NCE- 100L, 200L and 300L; Degree- 100L, 200L, 300L and 400L). A total of 350 questionnaires were administered but 315 of them were accurately filled and used for analysis.

3. Research Instrument

The main instrument used for data collection in this study was a self-constructed questionnaire. The questionnaire focused on six domains- demographics, perceived usefulness of ICTs, perceived ease of use of ICTs, behavioural intention to use ICTs, usefulness level of technological tools, and perceived challenges in ICT usage for Mathematics teaching. The demographic domain consists of age, gender, marital status, programme type and academic level. The other domains are structured in 5 Likert Scale questions ranging from Strongly Disagree (SD) to Strongly Agree (SA), Extremely Not Useful to Extremely Useful and Not at all to the extreme. The questionnaire was validated through 3 expert reviews and pilot tested among pre-service mathematics teachers from the University of Ibadan, Nigeria. A Cronbach coefficient of .78 was obtained for the questionnaire.

4. Data Analysis and Interpretation

The data collected were analysed using frequency counts, simple percentages, mean and standard deviation. To answer research questions 1,2 and 3, the weighted mean was calculated for each domain. The weighted mean is obtained through the respondent's scores against each item multiplied by the scores under each Likert scale point. The decision criteria for the weighted mean score are <2 (Low), $2 < \bar{x} \leq 3$ (average), $3 < \bar{x} \leq 4$ (high) while a weighted mean score of 4 and above was considered to be very high. For research questions 4 and 5, the mean score of items in the usefulness level of technological tools, and perceived challenges in ICT usage for Mathematics teaching domains were ranked based on the mean value of each item.

C. Findings and Discussion

1. Findings

Table 1. Demographic Characteristics of Respondents

Variable	Frequency	Percentage
Age		
16-20	102	32.4
21-25	156	49.5
26-30	55	17.5
31-35	2	0.6
Gender		
Male	148	47.0
Female	167	53.0
Marital Status		
Single	280	88.9
Married	35	11.1
Programme Type		

Degree	201	63.8
Nigeria Certificate in Education (NCE)	114	36.2
Academic Level		
100 level	77	24.4
200 level	98	31.1
300 level	90	28.6
400 level	50	15.9

Table 1 presents the descriptive information of the pre-service teachers. The table reveals that the majority of the respondents (49.5%) are within the age bracket of 16-20 years and the majority of them representing 53.0% are female. It also reveals that the majority of the respondents (88.9%) are single and the majority (63.8%) also reported being in the degree programme as well as a larger percentage of them (32.1%) are currently in their second year of the academic programme.

RQ1: What is the level of perceived usefulness of ICT to Mathematics teaching among pre-service teachers?

Table 2. Perceived Usefulness of ICTs for Mathematics Teaching

S/N	Items	SD	D	N	A	SA	Mean	Std.D
1	Students are more enthusiastic about Mathematics using ICTs as a medium of instruction	11 (3.5%)	11 (3.5%)	39 (12.4%)	133 (42.2%)	121 (38.4%)	4.09	.979
2	The use of ICT for Mathematics instruction appears to be an effective tool for students of all abilities	0 (0%)	16 (5.1%)	54 (17.1%)	162 (51.4%)	83 (26.3%)	3.99	.800
3	When using ICT, there will be room for personalized instruction.	1 (0.3%)	24 (7.6%)	117 (37.1%)	105 (33.3%)	68 (21.6%)	3.68	.907
4	ICTs provide environments that appeal to a variety of learning styles of my students	0 (0%)	6 (1.9%)	30 (9.5%)	172 (54.6%)	107 (34%)	4.21	.686
5	ICTs provide a means of expanding and applying what has been taught in class.	2 (0.6%)	7 (2.2%)	75 (23.8%)	149 (47.3%)	82 (26%)	3.96	.803
6	When using ICTs, my role will be as a facilitator of individual students' learning	3 (1%)	11 (3.5%)	60 (19%)	137 (43.5%)	104 (33%)	4.04	.864
7	ICT tools will enable students to cooperate more on projects.	0 (0%)	9 (2.9%)	99 (31.4%)	108 (34.3%)	99 (31.4%)	3.94	.861
8	ICTs enhances students' ability with Mathematics learning tasks (e.g., writing, analysing data, or solving problems).	13 (4.1%)	5 (1.6%)	23 (7.3%)	145 (46%)	129 (41%)	4.18	.942

9	The use of ICTs for Mathematics instruction would make the student feel more involved.	6 (1.9%)	9 (2.9%)	31 (9.8%)	161 (51.1%)	108 (34.3%)	4.13	.844
10	ICT tools would enable me to interact more with students	6 (1.9%)	24 (7.6%)	75 (23.8%)	131 (41.6%)	79 (25.1%)	3.80	.964
11	I believe by integrating ICTs in Mathematics teaching and learning, I am helping students to acquire the basic computer education needed for their future careers	3 (1%)	9 (2.9%)	38 (12.1%)	139 (44.1%)	126 (40%)	4.19	.828
12	I feel the use of ICTs for Mathematics instruction would affect my students' academic outcomes positively	6 (1.9%)	11 (3.5%)	53 (16.8%)	157 (49.8%)	88 (27.9%)	3.98	.872
Weighted Average: 4.02								

Table 2 above indicates that the overall perceived usefulness of ICTs for Mathematics teaching is very high (WA: 4.02) among the pre-service teachers. Specifically, the pre-service teachers strongly believed that ICTs provide environments that appeal to a variety of learning styles of students and agreed to the fact that integrating ICTs in Mathematics teaching and learning will help students to acquire the basic computer education needed for their future careers. Pre-service teachers also indicated that the use of ICTs for Mathematics instruction has the potential to make the students feel more involved and this may make them more enthusiastic about Mathematics as a subject.

RQ2: What is the level of perceived ease of use of ICTs for Mathematics teaching among pre-service teachers?

Table 3. Perceived Ease of Use of ICTs for Mathematics Teaching

S/N	Items	SD	D	N	A	SA	Mean	Std.D
1	Teaching Mathematics using ICTs is simple and flexible	3 (1%)	12 (3.8%)	39 (12.4%)	147 (46.7%)	114 (36.2%)	4.13	.842
2	ICTs are used to ease access to educational materials that can enhance Mathematics teaching.	4 (1.3%)	8 (2.5%)	23 (7.3%)	162 (51.4%)	118 (37.5%)	4.21	.788
3	The use of ICTs simplifies mathematical content for easy teaching	6 (1.9%)	15 (4.8%)	33 (10.5%)	150 (47.6%)	111 (35.2%)	4.10	.901
4	Teaching Mathematics using ICTs is easy and interesting	17 (5.4%)	30 (9.5%)	27 (8.6%)	137 (43.5%)	104 (33%)	3.89	1.129
5	ICTs are easy to manipulate during	6 (1.9%)	12 (3.8%)	74 (23.5%)	142 (45.1%)	81 (25.7%)	3.89	.898

	Mathematics teaching							
6	The use of ICT enhances Mathematics teaching and learning with less stress.	4 (1.3%)	38 (12.1%)	118 (37.5%)	94 (29.8%)	61 (19.4%)	3.54	.978
7	Communication with students is easy using ICTs	9 (2.9%)	21 (6.7%)	40 (12.7%)	168 (53.3%)	77 (24.4%)	3.90	.942
8	The use of ICTs is more convenient to teach Mathematics anywhere and anytime.	10 (3.2%)	32 (10.2%)	66 (21%)	122 (38.7%)	85 (27%)	3.76	1.057
9	Less effort is needed whenever ICTs are used to enhance Mathematics teaching.	2 (0.6%)	30 (9.5%)	50 (15.9%)	132 (41.9%)	101 (32.1%)	3.95	.958
Weighted Average (3.93)								

Table 3 indicates that pre-service teachers' perceived ease of use of ICTs for Mathematics teaching is high (W.A= 3.93). The pre-service teachers agreed with the notion that ICTs serve as a means to ease access to educational materials and their use is simple and flexible for teaching Mathematics. It was also agreed among the preservice teachers that ICTs remain an instrument that simplifies mathematical content for easy teaching

RQ3: What is the behavioural intention level to use ICTs for Mathematics teaching among pre-service teachers?

Table 4. Behavioural intention to use ICTs for Mathematics teaching

S/N	Items	SD	D	N	A	SA	Mean	Std.D
1	I intend to use ICTs to enhance my teaching of Mathematics going forward	2 (0.6%)	11 (3.5%)	89 (28.3%)	135 (42.9%)	78 (24.8%)	3.88	.845
2	I predict I will use ICTs in the teaching of Mathematics as a subject	6 (1.9%)	25 (7.9%)	22 (7.0%)	137 (43.5%)	125 (39.7%)	4.11	.973
3	I have a plan to use ICTs for teaching Mathematics soon	8 (2.5%)	20 (6.3%)	51 (16.2%)	136 (43.2%)	100 (31.7%)	3.95	.981
4	I think the use of ICTs will be a basis for future teaching of Mathematics	5 (1.6%)	28 (8.9%)	60 (19%)	153 (48.6%)	69 (21.9%)	3.80	.934
Weighted Average (3.94)								

Table 4 indicates that pre-service teachers' behavioural intention to use ICTs for Mathematics teaching is high (W.A= 3.94). The preservice teachers predicted their intention to use ICTs in the teaching of Mathematics as a subject and they plan to use ICTs for teaching Mathematics soon.

RQ4: Which technological tools are perceived to be more useful in Mathematics teaching among preservice teachers?

Table 5. Usefulness level of ICT tools to teach Mathematics

S/N	Items	Extremely Not Useful	Not Useful	Neutral	Useful	Extremely Useful	Mean	Rank
1	Radio	6 (1.9%)	7 (2.2%)	70 (22.2%)	130 (41.3%)	102 (32.4%)	4.00	11th
2	Television	5 (1.6%)	6 (1.9%)	33 (10.5%)	142 (45.1%)	129 (41%)	4.22	3rd
3	Computer	1 (0.3%)	5 (1.6%)	26 (8.3%)	130 (41.3%)	153 (48.6%)	4.36	1st
4	Tablets	1 (0.3%)	3 (1%)	33 (10.5%)	150 (47.6%)	128 (40.6%)	4.27	2nd
5	Mobile Phone	4 (1.3%)	6 (1.9%)	41 (13%)	146 (46.3%)	118 (37.5%)	4.17	6th
6	WhatsApp	10 (3.2%)	16 (5.1%)	31 (9.8%)	129 (41%)	129 (41%)	4.11	8th
7	Skype	4 (1.3%)	17 (5.4%)	75 (23.8%)	124 (39.4%)	95 (30.2%)	3.92	12th
8	Zoom	5 (1.6%)	23 (7.3%)	118 (37.5%)	97 (30.8%)	72 (22.9%)	3.66	15th
9	YouTube	2 (0.6%)	20 (6.3%)	45 (14.3%)	152 (48.3%)	96 (30.5%)	4.02	10th
10	Google Classroom	3 (1%)	13 (4.1%)	68 (21.6%)	115 (36.5%)	116 (36.8%)	4.04	9th
11	Geogebra	1 (0.3%)	17 (5.4%)	46 (14.6%)	128 (40.6%)	123 (39%)	4.13	7th
12	Portable	2 (0.6%)	20 (6.3%)	102 (32.4%)	102 (32.4%)	89 (27%)	3.81	14th
13	Graphic calculators	5 (1.6%)	12 (3.8%)	32 (10.2%)	133 (42.2%)	133 (42.2%)	4.20	5th
14	Spreadsheet	6 (1.9%)	6 (1.9%)	36 (11.4%)	136 (43.2%)	131 (41.6%)	4.21	4th
15	Audio/videotapes	8 (2.5%)	24 (7.6%)	63 (20%)	132 (41.9%)	88 (27.9%)	3.85	13th

Table 5 revealed that computers, Tablets, and Television ranked 1st, 2nd and 3rd respectively as the most useful technological tools for mathematics teaching. Equally, spreadsheets, Graphic calculators and mobile phones were ranked 4th, 5th and 6th respectively.

RQ5: What are the perceived challenges in using ICT to enhance Mathematics teaching among preservice teachers?

Table 6. Perceived Challenges in ICT Usage for Mathematics Teaching

S/N	Items	Not at all	Slightly	Moderately	Very	Extreme	Mean	Rank
1	Lack of fast internet connection	6 (1.9%)	3 (1%)	56 (17.8%)	109 (34.6%)	141 (44.8%)	4.19	2nd
2	Lack of orientation related to the use of ICTs for Mathematics instruction	15 (4.8%)	14 (4.4%)	34 (10.8%)	155 (49.2%)	97 (30.8%)	3.97	5th
3	Erratic Power supply	4 (1.3%)	5 (1.6%)	25 (7.9%)	123 (39%)	158 (50.2%)	4.35	1st
4	High fees of internet access	1 (0.3%)	5 (1.6%)	54 (17.1%)	146 (46.3%)	109 (34.6%)	4.13	3rd
5	Low digital literacy level	5 (1.6%)	27 (8.6%)	42 (13.3%)	133 (42.2%)	108 (34.3%)	3.99	4th

6	Inadequate awareness of some of the ICT tools that could enhance Mathematics teaching	30 (9.5%)	12 (3.8%)	38 (12.1%)	121 (38.4%)	114 (36.2%)	3.88	6th
7	General lack of interest to use ICTs to enhance Mathematics teaching	7 (2.2%)	37 (11.7%)	66 (21%)	117 (37.1%)	88 (27.9%)	3.77	7th
8	The high cost of technological devices to teach Mathematics	2 (0.6%)	17 (5.4%)	110 (34.9%)	122 38.7	64 (20.3%)	3.73	8th

Table 6 showed that erratic power supply, lack of fast internet connection and high fees for internet access ranked 1st, 2nd and 3rd respectively as major challenges in using ICTs to enhance Mathematics teaching among preservice teachers. Other things perceived to likely pose a challenge in using ICTs to enhance Mathematics teaching include but are not limited to low digital literacy level, lack of orientation related to the use of ICTs for Mathematics instruction and inadequate awareness of some of the ICT tools that could enhance Mathematics teaching. These issues were ranked 4th, 5th and 6th respectively.

2. Discussion

The primary objective of this study was to investigate the level of perceived usefulness, ease of use and behavioural intention of preservice teachers to use ICTs for mathematics instruction as well as to understand issues that may pose a challenge to the use of ICTs for mathematics instruction. Results from the study revealed that preservice teachers' perception of the usefulness of ICTs to enhance mathematics instruction is very high. This result is consistent with previous studies (Setyaningrum, 2016; Agufana, 2021). Specifically, the result could be attributed to the way ICTs have revolutionised virtually all human activities and the unique opportunity it offers students to learn at their own pace anywhere and anytime (Adelore & Itasanmi, 2016). Preservice teachers vehemently view the use of ICTs for mathematics instruction as a game-changer. They agreed with the view that ICT affords the students opportunity to learn in environments that accommodate individual differences aside from equipping them with digital skills needed for their future careers. Also, they opined that the use of ICTs for Mathematics instruction makes them active learners and this has the potential to increase their interest in the subject. Corroborating this view, Paudel (2015) asserted that the use of ICTs is helpful and effective for mathematics instruction. He pointed out that students are more motivated to learn when ICTs are incorporated into mathematics teaching because its more visual, interactive and stimulating compared to the traditional method of mathematics instruction.

Results of the study also indicate that preservice teachers' perceived ease of use of ICTs for mathematics instruction is high. This implies that preservice teachers have a strong degree of belief that using ICTs for mathematics instruction will require less effort to use. It was observed in the response of the preservice teachers that using ICTs for mathematics instruction is simple and flexible and less effort is needed whenever ICTs are used to enhance Mathematics teaching. A high level of perceived ease of use of ICTs for mathematics instruction among the preservice teachers, therefore, means that using ICTs to enhance the teaching and learning of mathematics is not difficult to understand, learn or do. Thus, providing evidence that the incorporation of ICTs into mathematics instruction may be less cumbersome and demanding to use for the

preservice teachers. According to Ramli and Rahmawati (2020), the more the perceived ease of use of technology, the greater the behavioural intention for the adoption of such technology. In other words, when ICTs for mathematics instruction is perceived as easy to use, preservice teachers will choose to adopt them for mathematics instruction.

On the usefulness level of some technological tools that can be used to enhance mathematics instruction, results of the study revealed that computers, tablets, and television were ranked as the most potent ICT tools that can effectively facilitate Mathematics teaching and learning. the reason these tools are rated higher compared to other tools could be associated with their multimedia capabilities that may reinforce concepts and appeal to a wider variety of learning styles (Wiest, 2001). Specifically, computers and tablets provide an opportunity for individualised mathematics instruction i.e., students can work in their space and have meaningful and instant feedback on progress. Also, these tools can enhance the mathematic lecture experience as instruction can be given to many students on a step-by-step basis with teachers having ample opportunity to quickly respond to unplanned questions and most importantly record all lecture details for students who failed to join the synchronised session and others who may desire to watch it for clarification on some grey areas (Galligan, Loch, McDonald, & Taylor, 2010).

The result of this study further indicated that erratic power supply, lack of fast internet connection and high fees for internet access were perceived by the preservice teacher as the greatest challenge to the effective use of ICTs for mathematic instruction. This result aligns with previous studies (Agyei & Voogt, 2010; Setyaningrum, 2016; Adelore & Itasanmi, 2016; Ebire, 2020). This result could be attributed to the fact that epileptic power supply in Nigeria has been a perennial challenge and this has affected a lot of developmental projects as well as the growth and development of the nation's economy. Equally, internet access in the country is an expensive commodity. In most rural areas, it is either unavailable or the speed is slow. However, in urban areas that are much available, it's too expensive (Tayo et al., 2015). On average and across providers of the internet in the country, the cost of a gigabyte of data stands at One Thousand Naira (₦1000). Thus, it becomes difficult for salary earners in a country where the minimum wage is Thirty Thousand Naira (₦30,000) to access the internet with an amount that is about 3% of their monthly income (Ajari, 2019).

D. Conclusion

The study assessed preservice teachers' perceived usefulness, ease of use and behavioural intention to use ICTs for mathematics instruction in Nigeria. Results revealed that the perceived usefulness of ICTs to enhance mathematics instruction among the pre-service teachers was found to be very high. Thus, a conscious effort must be made by stakeholders (teacher training institutions, school administrators, parents and government at all levels) to translate this high perception into the actual use of ICTs for mathematic instruction in classrooms. Also, the perceived ease of use of ICTs for mathematics instruction among the preservice teachers was high. This points to the fact that policy decisions for the implementation of ICTs for mathematics instruction should be based on the consciousness that it will require less effort for teachers to effectively use it. Thus, more priority should be given to the deployment of appropriate ICT tools for mathematics instruction than planning rigorous training for its use. Though, many ICTs tools exist that can effectively be utilised for mathematics instruction but more priority should be given to computers, tablets and television. This is based on the ratings of technological tools suitable for mathematics instruction by the preservice teachers based on the multimedia capabilities of these tools. Lastly, while there are myriads of challenges perceived by the

preservice as impediments to effective use of ICTs for mathematics instruction, major issues centred around the power supply, lack of fast internet connection and high fees of internet access. This, therefore, calls for infrastructural upgrades generally in the country and the subsidization of internet access, especially for educational purposes.

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