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Mathematics Teachers' Perception on the Problems of Integrating ICT in Teaching Mathematics in Secondary Schools in Zamfara State, Nigeria

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Abstract
The study assessed mathematics teacher's perception on the problem of integrating ICT in teaching mathematics in secondary schools in Zamfara State, Nigeria. A survey research design was adopted for the study. The population of the study consisted of 200 mathematics teachers in all the 60 public secondary schools in Gusau Metropolis of Zamfara State. A sample size of 40 (25 males and 15 females) mathematics teachers were randomly selected using a simple random sampling technique. The instrument for data collection was used a structured questionnaire titled: Teachers Perception on the problem of Integrating ICT Questionnaire (TPPIICTQ). Two research questions was raised and one null hypothesis was formulated to guide the study. The questionnaire was subjected to face validity by experts in mathematics education. Reliability index of 0.86 for the instrument was obtained using Cronbach Alpha. The Data collected was Analysed using Mean, Standard Deviation to answer the research questions. While Mann-Whitney U- test was the statistical tool used for testing the null hypothesis at $p \leq 0.05$ level of significance.. The findings among others revealed that that, secondary school mathematics teachers lack ICT Skill and knowledge in teaching. Also, there was no significant difference between the perception level of male and female mathematics teachers on the problems of integrating ICT in teaching mathematics. It was therefore recommended among others that mathematics teachers should be trained to have the basic skill on how to use the ICT in teaching mathematics.

Keywords: Mathematics, Teacher, Perception, Integrating, ICT, Mathematics

Introduction
Information and Communication Technology (ICT) is gradually turning the world into a global village. The pedagogical application of information and communication technologies (ICTs) has become a central focus globally. For the nation to achieve the target of scientific and technological development, there is dare need to change the method of teaching and learning mathematics from traditional approach of "talk and chalk" to ICT enhanced pedagogical approach. The interactive nature of ICT materials provides opportunity for students to interact, assimilate,

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collaborate and take control of the learning process allowing students to work independently. Amoo (2010) indicated that if ICT facilities integrated in junior and senior secondary schools are of good quality and the students have access and utilize the facilities, there is hope that the attitudes of students would change; there might be improved motivation towards learning school subjects (Mathematics inclusive). Nwoke (2010) stated that the use of computer as an ICT hardware in teaching and learning of mathematics enables the students to have immediate judgment of their problem solving efficiency as it allows them to have feedback which permits reinforcement. Researchers as indicated above have shown that integration of technologies into classrooms have great impact on learning and thinking skills among students. Technology in general and ICT in particular is an aid to teaching and a tool in the facilitation of learning. (Adegoke & Owolabi, 2007). Integration of information and Communication Technology (ICT) in education has changed conventional methods of teaching and learning to a more proactive and dynamic approach where face-to-face approach is no longer the only communication between teachers and students. Information and Communication Technology (ICT) are the material resources provided for educators optimize their productivity in teaching and learning process (Nwanunu & Isuwa, 2017). Also Olugbenga and Adebayo (2010) defined information and communication technology as collection, retrieval, use and storage and communicating information through the use of computers and micro electronic system. Meleisea (2007) viewed ICT as a technology of creating, displaying, storing, manipulating and exchanging information. Waziri, Bello & Mohammed (2010) noted that ICT makes teachers to teach mathematics effectively and dynamically as it is more visual, interactive and stimulating. Students also become excited and motivated when ICT instruments are used in teaching; ICT is seen as a good instruction.

The introduction of information and communication technology (ICT) in mathematics education programme makes teaching and learning increasing flexible, multitasking and performance base in this technology age, a functional educational system enabled by information and communication technology would be a veritable tool for improving performance and the overall standard of an educational system. In Nigeria, the integration of ICT in the educational system and with particular reference to secondary schools has been sluggish, or in fact near to nothing. Unfortunately, the teaching and learning of mathematics in Nigeria has been unsatisfactory, students find it difficulty in understanding the mathematics lessons and this translates to poor achievement in school and national examination, one of the factor responsible for poor students ' achievement in mathematics is insufficient knowledge in the use of ICT(Ottevanger et-al,2007 as cited in Okwuoza et-al,2017).

However there are problems which hinder greatly the integration of ICT in teaching and learning mathematics in secondary schools mathematics teachers are faced with inhibiting challenges or barriers to computer use (Hudson & Porter, 2010). The teacher level obstacles are more difficultly for policy makers to tackle as it is the teachers themselves who need to bring about the required changes in their own attitude and approach to ICT. However Gan et.al 2011) suggested that, the integration of ICT into the mathematics classroom depends on individual teachers as well as the schools contextual factors. Research indicates that lack of teachers' confidence prevents teacher from using ICT in their teaching (Peeraer & van Petegan, 2011). Teachers' competence is a major predictor of integrating ICT in teaching. Evidence suggests that majority of teachers who reported negative or neutral attitude towards the integration of ICT into teaching and learning processes.. However, research findings have shown that there is still room for improvement. Guwan (2014) carried out a study on the use of ICT in teaching of mathematics in secondary schools in

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Jos-North Local Government of Plateau State. Teachers' from both private and government schools were used as sample for the study. The findings of the study showed that students were willing to learn mathematics through computer. He also found that many teachers still need training in the use of mathematics software. He therefore recommended that mathematics teachers should be trained in the use of ICT in mathematics as well as having access to the equipment (i.e laptops, projecting and the use of internet) .School related challenges refer to inadequate provided resources such as infrastructure, support trainings. Successful use of technology for the benefit of children depends on the knowledge of teachers and confidence and competence in using technology. So not only do teachers need to learn how to use technology, they also need to learn how to apply the technology in teaching and learning. In addition they need to know which technologies will most effectively meet children's skills, abilities and needs (Girgin, et.al 2011) from the fore-going statement, it can be agreed that for integration of ICT into the mathematics classroom solely depends on teachers. The importance of Information Communication Technology (ICT) in the teaching and learning of mathematics cannot be over emphasised, ICT in the school system is part of new innovation to foster the standard of science, technology and mathematics (STM) education in Nigeria. Hence, it is clear that the use of ICT in the teaching and learning of mathematics is imperative. The use of technology should start from primary schools, So that both the teachers and students are acquainted. There are needs to know the problems of integrating ICT in teaching mathematics, and how it hinders the performance of students in mathematics. This study, therefore, examine mathematics teachers perception on the problems of integrating ICT in teaching mathematics in secondary schools in Zamfara state, Nigeria.

The Teaching and Learning of Mathematics at all levels of Education in Nigeria is for students to achieve and retain the knowledge they acquire. However Mathematics teacher teaches mathematics through teacher centred learning, whereby students are passive learners, but with the knowledge of ICT, mathematics teacher can easily applied it in mathematics instructions to enhance learned centred classroom.Thus, this study was set out to examine Mathematics teachers' perception on integrating ICT in teaching and learning Mathematics at Secondary School level in Zamfara State, Nigeria.

Objectives of the Study

The main purpose of this study was to find out Mathematics teachers perception on the problems of integrating ICT in teaching mathematics in secondary school in Zamfara state, Nigeria specially, the study determined the:

1. Perception of Mathematics Teachers on the problems of integrating ICT in teaching mathematics in secondary schools in Zamfara State.
2. Gender difference in perception of Mathematics Teachers on the problem of integrating ICT in teaching mathematics in secondary schools in Zamfara State

Research Questions

1. What is the perception of Mathematics Teachers on the problems of integrating ICT in teaching mathematics in secondary schools in Zamfara State?
2. Is there difference between male and female mathematics teachers in their perception on the problems of integrating ICT in teaching mathematics in secondary schools in Zamfara State?

Hypothesis

There is no significant difference in the mean perceptions of male and female mathematics teachers on the problems of integrating ICT in teaching Mathematics in secondary schools in Zamfara State.

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Methodology

The research adopted a survey research method which involves the collection of data, using questionnaire for the purpose of describing and interpreting existing condition about a given population. The population of the study consisted of two hundred (200) mathematics teachers in public secondary schools in Gusau metropolis of Zamfara State. 2 mathematics teachers were drawn from each of 20 secondary schools sampled, using a simple random sampling techniques. Therefore, the sample size for the study comprises of forty (40) mathematics teachers made up of 25 males and 15 females. The instrument used was a questionnaire on Teachers' perception on problems of integrating ICT (TPPIICTQ) in teaching mathematics .The questionnaire contained two sections, that is Section A, and B. Section A revealed teachers personal information, while Section B gave information on Mathematics teacher perception on problems of integrating ICT in teaching mathematics, and contained 10 items. In section B was modified on four points Likert scale; Strongly Agreed (SA) Agreed (A), Disagreed (D) and Strongly Disagreed (SD) was adopted. The research instrument was validated by two senior lecturers in Mathematics Education section from Ahmadu Bello University Zaria. The experts' comments and suggestions were used in modifying some items. This made the instrument to be finally accepted as the reliability the instrument was determined by administering the instrument twice with an interval of two weeks using the test-retest method. The instrument was administered to 10 Teachers of Secondary schools that were not parts of the participating sample schools but have similar characteristics, the data collected from the two administrations were subjected to a reliability test. Cronbach alpha coefficient was used to determine the reliability of the instrument and it yielded a reliability index of 0.86, which make the instrument reliable for the study. For the administration and collection of the questionnaire the researchers obtain permission from the school principal of the selected secondary schools to carry out the study.

The researchers and two research assistants that were recruited administered copies of the questionnaire to 40 Mathematics Teachers in 20 Secondary Schools. The 40 Teachers filled questionnaire and were retrieved by the research assistants for data analysis. The data gathered through the use of questionnaire and records from the selected secondary schools mean and standard deviation were used to answer the two research questions while Mann-Whitney U-test was used to test the hypothesis one at 0.05 level of significance.

Result

Research Question 1

What is the perception of Mathematics Teachers on the problems of integrating ICT in teaching mathematics in secondary schools in Zamfara State?

Table1: Mean and Standard Deviation of mathematics Teachers' perception on the problems of integrating ICT in teaching Mathematics

S/N	ITEMS	Mean	Decision
1	Mathematics teachers' lack of ICT skills and knowledge.	3.25	Accept
2	Inadequate ICT infrastructure for teaching and learning mathematics.	3.28	Accept
3	Mathematics teachers lack experience in using computer	2.80	Accept
4	Large class sizes.	2.85	Accept
5	Lack of availability ICT resources.	2.60	Accept
6	Inadequate time to integrate ICT in teaching mathematics curricula	3.75	Accept
7	Lack of teachers' confidence and competence in using ICT in teaching.	2.50	Accept
8	Lack of standby electric generating set	2.90	Accept
9	Individual poor attitude to acquire ICT skills.	2.97	Accept
10	High cost of ICT equipment/resources.	3.63	Accept

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From the Table1 shows the mean scores analysis of mathematics teachers' perception on the problem of integrating ICT in teaching mathematics in secondary schools in Zamfara state, Nigeria. All the items from 1- 10 were accepted with the mean score of and above the criterion mean of 2.50.Indicating that the respondents agreed that the items were perceived to be the problems of integrating ICT in teaching mathematics in secondary schools in Zamfara state, Nigeria.

Researches Question 2

Is there difference between male and female mathematics teachers in their perception on the problems of integrating ICT in teaching mathematics in secondary schools in Zamfara State?

Table 2: Mean rank score on Male and female Mathematics teacher perception level

Gender	N	Mean Rank	Median Rank
Male	25	58.73	59.00
Female	15	42.38	44.21
Total	40		

Table 2 shows that the mean and median ranks on Male and Female Mathematics Teachers perception on the problems of integrating of ICT in teaching mathematics. The mean and median rank on perceptions of male teachers (M =58.73, MD =59.00) was higher than (M=42.38. MD = 44.21) for female mathematics teachers. That means that the perception of male mathematics teachers on the problems of integrating of ICT was higher than that of female mathematics teachers.

Null Hypothesis HO_1

There is no significant difference in the mean perception of male and female mathematics teachers on the problems of integrating ICT in teaching Mathematics

Table 3: Analysis of Mann- Whitney U- test of Perceptions of Male and Female Mathematics Teachers on the problems of integrating ICT in Teaching Mathematics

Gender	**N**	**Mean rank**	**Median rank**	**Mann-Whitney U-test**	**P**	**Remark**
Male Teachers	25	58.73	59.00	6103.5	0.15	Not Sig.
Female Teachers	15	42.38	44.21			

Significant at $p \leq 0.05$

Table 3 reveals that calculated p- value is 0.15.Therefore,p-value of 0.15 is greater than significant value of $p \leq 0.05$. Based on this evidence, the null hypothesis was not rejected. This shows that there was no significant difference in the perception scores of male and female mathematics teachers on the problems of integrating ICT in teaching mathematics. The null hypothesis which stated no significant difference in the mean perception of male and female mathematics teachers on the problems of integrating ICT in teaching Mathematics was retained. This implies that their perceptions are alike irrespective of gender.

Discussion of findings

From the findings of this study, the result in table 1 showed that all the items are problems associated with integrating ICT in teaching and learning of mathematics. This is evident in their

mean scores of mathematics teachers which were above the benchmark of 2.50. This study is support of studies by (Hidson & porter, 2010; Peeraer & Van, 2011).who reported that the problems that mathematics teacher have in integrating ICT in teaching mathematics relate mostly to their inability to use ICT facilities, and lack of skills and knowledge. The results also collaborate with Guwan (2014) who found that many teachers still need training in the use of mathematics software.

The findings also reveals that there was no significance difference between the perception of male and female mathematics teachers on the problems of integrating ICT in teaching mathematics. This finding collaborates with the finding Gan, et-al (2011) suggested that integration of ICT into mathematics classroom depends on individual teachers as well as the school contextual factors.

Conclusion

The conclusion drawn from the findings of this study was that all mathematics teachers perceived those are the problems of integrating ICT in teaching mathematics in secondary schools in Zamfara state. Also mathematics teachers irrespective of gender had the same perception.

Recommendations

1. Secondary schools should be equipped with computers, as well as gadgets to foster the student's interest and academic performance for effective use of ICT in teaching and learning.
2. Mathematics teachers' gender should not be a barrier in integrating ICT in teaching mathematics in secondary schools.

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