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INVESTIGATING MATHEMATICS TEACHER'S PERCEPTION OF ICT USEFULNESS AS AN INSTRUCTIONAL TOOL FOR TEACHING AND LEARNING MATHEMATICS IN SECONDARY SCHOOLS IN CROSS RIVER STATE

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Abstract
The study investigated mathematics teachers' perception of ICT usefulness as a tool for teaching and learning mathematics. The sample of the study consisted of 99 mathematics teachers (59 males and 40 females) who were currently teaching mathematics at the secondary school level in five out of the Seven Education Zones of Cross River State. The instrument used for data collection was a self-designed twenty-item structured question on Mathematics Teachers' Perception of ICT. Usefulness (MTPIU). Three hypotheses were formulated and each was tested at 5% level of significance. The data were analysed using Chi-square statistics. The findings revealed that mathematics teachers had strong perception about the usefulness of ICT for teaching and learning mathematics in schools but had poor exposure. Hence, it was concluded that Mathematics teachers' disposition towards ICT could be influenced by ICT equipment and facilities available in schools. It was recommended that Capacity Building Workshops on ICT incentives for teachers among others can develop teachers' sensitivity and encourage them to use ICT Mathematics education.

Keyword: *Perception, Exposure, Usefulness, ICT, Tool.*

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Background to the Study

Information is considered today as one of the basic needs of people after air, water, food and shelter. To a great extent information is becoming natural part of man's daily life that its use in education is a necessity. There is evidence of rapid revolution of ICT at home, in the entertainment field as well as in the classroom (IIoh and Obigie, 2011). The 21st century is an era in which the world is experiencing information revolution in every field of study. The development of video tapes, cameras, close circuit television, the internet and computer can be described as a giant stride towards Information and Communication Technology (ICT) is an acronym that stands for Information and Communication Technology Fleming, et al (2007) defined ICT in the context of computer, communication equipment and services associated with them, the telephone cellular network, satellite, broadcasting media and other forms of communication.

In a similar vein. Blurton (2002) viewed ICT as a diverse set of technological tools and resources such as computers, the internet; broadcasting technologies (radio and television) and telephone used to communicate, and create, disseminate, store and manage information. The foregoing discussion signals to the fact that computer and internet are central to ICT and have been of supreme importance of effective delivery and understanding of mathematics education is primarily concerned with the improvement of teaching and learning of mathematics. A great deal of information and communication on a regular basis is often by both the teacher and the learner in the process of teaching and learning mathematics in schools. Therefore, the crucial roles that ICT plays in improving the quality of information and communication and equipping students with the skills and knowledge for global competiveness have been documented in (Owolabi and Faleye, 2009; Olaniyan, 2011). It must be noted that ICT has revolutionized the teaching and learning of mathematics in the United State of America and Britain just to mention a few.

The Federal Government of Nigeria is aware of the important role of ICT for effective delivery of a wide range of subjects when it states that there is urgent need to integrate ICT into education in Nigeria (NPE, 2004). Based on the educational significance of ICT in the academic sector, the Federal Government of Nigeria launched her first satellite in 2005 and the second in May 2007 for the reach of Nigerians. Meanwhile, we need to note that the rationale for integrating ICT into mathematics education is premised on the benefit derivable from ICT. Research studies (Ipusu and Ukama, 2008) have indicated that science and mathematics develop faster in countries that embrace ICT. Based on the educational significance of ICT the National Council of Teachers of Mathematics (NCTM, 2001) declared that every student and teacher should have access to appropriate ICT. The overwhelming conclusion of most research studies is that ICT integration in schools would benefit students tremendously in mathematics education. therefore, there is every need to harness its potential for education development.

Furthermore, research studies (Drennan et al, 2005) Goktas and Yildirim, 2009) have documented the perception of teachers about the usefulness of ICT. It is a motivator for teachers' to use ICT in teaching and learning situations. Also research studies (IIoh and

Oblie, 2011) remarked that teachers perceived usefulness of ICT is an important predictor of teachers teaching performance. The foregoing discussion is a signal to the fact that teachers perceived usefulness of ICT is essential and fundamental and can be used to predict teachers teaching performance in mathematics. Volumes have been written on the challenges confronting the use of ICT for education in Nigeria. Research Studies (Jegede and Owolabi, 2005) expressed that teachers in Nigeria are themselves not ICT literate while the few that are knowledgeable and competent in ICT do not integrate ICT into their teaching. Ajadi and Adeoye, (2005) highlighted lack of infrastructure high telephone and internet costs and incessant power failure and so on as responsible for limited exposure to ICT in the third world.

Therefore, this is a disturbing scenario to which experts and experienced educators in the field of mathematics education must show interest. Concerned with the phenomenon; this study is motivated to investigate the mathematics teachers' perception of ICT usefulness as an instructional tool for teaching and learning mathematics in the secondary schools. It is expected that the finding of this study would provide the basis to access the level of awareness of the mathematics teachers about ICT as an instructional tool for mathematics education in secondary schools.

Purpose of the Study

The purpose of this study was to examine:

1. The perception of mathematics teachers about the usefulness of ICT as a tool for instructional process in mathematics.
2. The exposure of mathematics teachers to use of ICT as a tool for instructional processes in mathematics
3. Mathematics teachers' perception about two major challenges confronting the use of ICT as a tool for instructional process in mathematics

Hypotheses

To guide this study, the following hypotheses were formulated

1. H_{01}: There is no significance perception of teachers about the usefulness of ICT as a tool for teaching and learning mathematics.
2. H_{02}: There is no significance exposure of mathematics teachers to use of ICT as a tool for instructional processes in mathematics.
3. H_{03}: There is no significance difference in perception of teachers about the effect of inadequate infrastructure and ICT illiteracy as challenges confronting ICT exposure of teachers.

Methodology

Instrument

The main instrument used for this purpose of data collection in this study was a self-designed questionnaire on Mathematic Teacher's Perception on ICT Usefulness as a tool for instructional processes tagged (MTPIU). The instrument has two sections: section A requested for the demographic data of respondents on age, grade, sex years of experience and educational qualifications while section B contained twenty-question items on which

respondents were required to tick the appropriate options on a 4-point LIkert scale type of Strongly Agree (SA) to Strongly Disagree (SD).

Validity and Reliability of Instrument
To ensure validity of the instrument the draft questionnaire was subjected to vetting by experts in the field of education and psychometrics. The experts' suggestions were included in the final draft of the scale. This ensured its content and face validity. However, a test-retest method was used to ensure the scale's reliability. The reliability index of the instrument was found to be 0.83 using Cronbach Alpha.

Population and Sample
The population for the study comprised all Mathematics teachers in secondary schools in Cross River State. Purposive sampling technique was used in selecting the sample for this study which consisted of 99 Mathematics teachers in 5 out of 7 Educational Zones from 18 L. G. G of Cross River State who attended the ICT capacity building workshop for Mathematics and Science Teachers of F.C.E. (Sp), Obudu between 10^{th} – 20^{th} May, 2011.

Procedure for Data Collection
The researchers with the help of some teachers and participant administered the questionnaire to the sampled respondents. Instructions were given to respondents, the questionnaire were retrieved by the researchers. The return rate was 100% which was found very satisfactory.

Data Analysis
The data collected was subjected to Chi-square (-) statistical analysis

Presentation of Result
The findings of this study are hereby presented table by table

Hypothesis one:
There is no significance perception about the use of ICT as a tool for teaching and learning mathematics.

Table 1: Mathematics Teachers' Perception of ICT Usefulness for Teaching.

Frequencies	Perceptions					DF	X^2-tab	X^2-tab	Remark
	1	2	3	4	5				
(observed frequency)	95	97	98	60	92	4	11.6	9.94	significance
Expected frequency	88.4	88.4	88.4	88.4	88.4				

a-level = 5%

The calculated was found to be 11.64, while the table was 9.84. Therefore, hypothesis one that state that there is no significant perception about the usefulness of ICT as a tool for

teaching and learning mathematics was rejected. Hence, Teachers have strong perception about the usefulness of ICT as a tool for teaching and learning mathematics in schools.

Hypothesis Two: There is no significant exposure of teachers to ICT as a tool for teaching and learning mathematics

Table II: Mathematics Teachers Exposure to ICT

Frequencies	Exposures					DF	X^2-tab	X^2-tab	remark
	1	2	3	4	5				
(observed frequency)	77	97	98	91	92	4	3.099	9.94	Not significance
Expected frequency	91	91	91	91	91				

a-level = 5%

The Chi-Square Calculated was found to be 3.099 while the Chi-Square tabulated was 9.94. Therefore, hypothesis two that states that there is no significant exposure of teachers to ICT as a tool for teaching and learning mathematics was accepted. Hence, teachers have no poor exposure to ICT as a tool for teaching and learning mathematics.

Hypothesis Three: There is no significance difference in perception of teachers about the effect of inadequate infrastructure and ICT illiteracy as challenges confronting ICT exposure of teachers.

Table III: Mathematics Teachers' Perception of Barriers to ICT Exposure

Variables	Barriers to Exposure of ICT		DF	X^2-cal	X^2-tab	Remark
	Inadequate of infrastructure	ICT illiteracy	1	0.412	3.84	Not significance
Agree	85(86.5)	85(86.5)				
Disagree	14 (12.5)	14 (12.5)				

a-level = 0.05

The –calculated was found to be 0.412, while the table was 3.84. Therefore, the hypothesis that states that there is no significant difference in perception of teachers about the effect of inadequate infrastructure and ICT illiteracy as challenges confronting ICT exposure was accepted. Hence there is no significant difference in the perception of the two factors by the teachers as challenges contributing ICT exposure.

Discussion of Findings

The findings of this study have shown that mathematics teachers have high perception about the usefulness of ICT for teaching and learning mathematics in schools as illustrated in Table I. This implies that if ICT facilities and training are made available for teachers' use, they are likely to use them for teaching and learning mathematics in schools. By implication this means that teachers are sensitive to the fact that the teacher's use of ICT might contribute to effective delivery of mathematics education.

However, this finding corresponds with the findings of (Drennan, et al, 2005; Goktas and Yildrim, 2009) who found that teachers perception about the usefulness of ICT across a range of subjects was high. The findings of hypothesis two as illustrated in Table II shows that there is no significant exposure of teachers to ICT as a tool for teaching and learning mathematics. This means that teachers have poor exposure to ICT as a tool for teaching and learning of mathematics. Effective learning mathematics would require those mathematics teachers that have significant exposure to ICT education. this means that high level of exposure to ICT education by teachers becomes highly necessary.

This finding is not out of place as (Jegede and Owolabi, 2005) supported the assertion that teachers do not have sufficient exposure to ICT usage for instructional processes in schools. However, exposure to ICT is a paramount factor which needs to be considered for effective delivery of mathematics education. It is therefore expedient to sufficiently expose mathematics teachers to training on ICT, provide ICT facilities in order to have access to appropriate ICT as documented in (NCTM, 2001).

It can also be seen from Table III that there is no significant difference in perception of teachers about the effect of inadequate infrastructure, ICT illiteracy as challenges confronting their ICT exposures. By implication, this means that the two factors being considered affect on equal level the exposures. By implication, this means that the two factors being considered affect on equal level the exposure of teachers to ICT. This suggests that the two factors should be given maximum attention in order to boost the quality of mathematics education. however, the result of the test of hypothesis three seems to have corroborated the findings of the previous researchers (Ajadi and Adeoye 2005) and Jegede and Owolabi (2005) that inadequate ICT infrastructural facilities, high telephone and internet costs, incessant power failures and ICT illiteracy are responsible for limited exposure to ICT in the Third World Countries.

Conclusion

It can be concluded from the findings that mathematics teachers perceived strongly the usefulness of ICT in making mathematics teaching meaningful, sensible and rewarding. Mathematics teachers may be willing to use ICT while teaching mathematics if the necessary equipment is provided. The low level of exposure of mathematics teachers to ICT may be attributed to the low level of computer literacy, inadequate ICT infrastructural facilities and incessant power failures.

Recommendations

Based on the findings obtained from the study, the following recommendations are made:

1. There is need for National Policy Document on ICT on nurture a new generation of teachers who will be able to use ICT as a tool for effective delivery of mathematics education in schools.
2. Workshops, Conferences, Seminars should be organized at all levels of education in order to popularize ICT education in effective delivery of mathematics education for schools.

3. Capacity Building Workshops should be organized for mathematics teachers in order to develop sensitivity towards ICT application in mathematics education.
4. Government at all levels should improve infrastructural facilities and provide the relevant teaching materials to make ICT work in our educational systems.
5. There is need to increase the pay of teachers in order to boost their morale, job satisfaction and thereby harvesting the best from them.

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