



SCHOOL LOCATION AND LEVELS OF TEACHING EFFECTIVENESS OF MATHEMATICS TEACHERS IN TERMS OF KNOWLEDGE OF SUBJECT MATTER AND EFFECTIVE CLASSROOM COMMUNICATION IN CALABAR EDUCATION ZONE OF CROSS RIVER STATE, NIGERIA

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ABSTRACT

This study examined school location and the levels of teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication in Calabar Education Zone of Cross River State, Nigeria. To achieve the purpose of this study, one hypothesis was formulated to guide the study. Literature related to the variables under this study were reviewed accordingly. Survey research design was adopted for the study. The census sampling technique was adopted for the study. A sample of 201 teachers were randomly selected for the study. The questionnaire was the main instrument used for data collection. To test the hypotheses independent t-test and population t-test analysis statistical technique were adopted. The .05 level of significance was used for the statistical testing of the hypotheses. The result of the analysis revealed that, school location significantly influence teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication. The result also revealed that the levels of teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication in Calabar Education Zone of Cross River State are significantly high. Based on the findings of the study, it was recommended that teachers should use chalk that will give a sharp contrast and easy to the students' view, the teacher should write boldly and legibly. The teacher should face the students while explaining steps involved in calculation in mathematics, teachers should avoid blocking the students' view of the board while writing. Also, government should not relent in the effort in sustaining best school plant planning in schools.

INTRODUCTION

The importance of teachers in nation building is recognized all over the world.

The progress and development of a nation largely depend on its teachers' quality. This is because of their noble and massive contributions

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in nation building cannot be over emphasis. They offer remarkable contributions in making and shaping each and every person in the society. The quality of education is determined by the quality of teachers (Fakeye, 2012). This view was corroborated by Anagbogu, Idajor and Owan (2016) who attributed issues of examination malpractice to socio-economic factor. To make learning more meaningful, understandable and fruitful to a learner, effectiveness of teaching delivered by a teacher is a very essential condition. Fakeye (2012) defined 'teaching effectiveness' as a manifestation of knowledge of content, skills in lesson presentation and creating desirable atmosphere for learning. The author further viewed teaching effectiveness as a kind of classroom transaction that occur between teachers and students which result in increase in students' knowledge. Adeyemi (2010) also defines teaching effectiveness as the type of teaching characterized by the exhibition of intellectual, social and emotional stability, love for children and positive disposition towards the teaching profession and ability to inspire good qualities in students.

The role of the teacher therefore is also to produce skilled manpower that can ensure effective development of the social, political, educational, economical, scientific and even military sectors of a nation. It is believed that the amount of learning that can be acquired from a teacher will vary directly with his/her personal variables such as age, gender, marital status, mastery of subject matter, qualification, experiences among others (Okon, 2014). Thus, there are certain factors or variables, both internal and external to the teacher that determine, influence or can be used to predict teaching effectiveness of the teacher.

The teacher is a role model to learners under his/her control and must possess the qualities that can assist the learner to acquire the necessary knowledge and skills. In line with this, Jannana (2006) held that competent, experienced and effective teachers are those that give their students the opportunity to explore ideas for themselves by engaging them in activities that can enable them learn on their own. Teachers' experience can be observed in terms

of the changes in students' attitude towards learning and determining the level of students' learning which also affects teacher's effectiveness. The teacher is the curriculum implementer, a guide to learning, a facilitator and a major factor for instructional effectiveness which is crucial for the improvement of students' academic performance in any subject in school (Adewale, 2004). The task for quality education in Nigeria and the development of citizens and the nations have been placed on the teachers. There is need for adequate qualification, experience, additional training and retraining through pre-service, in-service and other environmental variables to be inculcated into the educational system to enhance effective teaching and learning.

The bedrock of all science related courses is usually said to be Mathematics. It is the foundation of all technological advancement of every nation (Bassey, Owan, Amansoa and Otu, 2020). Being aware of this, the Federal Government of Nigeria through her National Policy on Education FGN (2014) maintains the compulsory nature of Mathematics in all levels of education, up to tertiary level (though as a general course at the tertiary level). Owing to this, governments at all levels are making serious efforts to provide high quality Mathematics education. It is worthy of note that recognizable attempts, by various stake holders, have been made to enhance teaching and learning of Mathematics.

Enukoha (2013) asserts that students' poor performance in examination may not be completely linked to teachers' variables. The reason being that psychological, socio-economic, personal-social and environmental factors also influence students' academic performance which are not teacher related factors. Pickerin and Shaw (2017) opined that there appears to be concern amongst older people with regard to teaching effectiveness. Advancing in age and experiences may enhance teacher's effectiveness. Gender as one of the personal variables concerns women as well as men. The understanding of gender means understanding the opportunities and constraints as they affect both men and women.

Mathematics is important to every individual irrespective of culture, religion, tribe, social status, and gender, in a way that it merged along with daily life. Liakopoulou, (2011) noted that everywhere we go, everything we do or propose to do, either the structure of Mathematics or its application plays a vital role in national development and this is why most countries, races and people emphasized in all aspects of studying, developing, and applying Mathematics. At a psychological level, exposure to mathematics helps in developing an analytic mind and assists in better organization of ideas and accurate expression of thoughts.

The importance of mathematics can be understood by the definition given by (Aguale, 2004) who opined that mathematics is a language in which God has written the world. While science provides the springboard for the growth of technology, mathematics is the gate to sciences. In other words, it is the level of mathematics that determines the level of the science and technological component of any nation. Therefore, mathematics plays a vital role in nation building.

Azuka (2015) identified the fundamental reasons for teaching Mathematics in schools which include: contributing to the technological and socio-economic development of a society; contributing to its political ideology, cultural maintenance and development and providing individuals with prerequisites which may help them cope with life in the various spheres of education or occupation, private life, social life and life as a citizen. Effective teaching, according to Erickson (2013), requires careful listening since it builds on how students think; and to use students' mathematical thinking, teachers need to listen with the intent of using that thinking in order to build the classroom understanding of the mathematics.

Apart from the knowledge of mathematics concepts, awareness of any classroom occurrence that can lead to learning in mathematics class is very relevant. The basic ingredient of learning mathematics is active participation of learners (Akinoso, 2016). Noting the relevance of mathematics to everything in life, poor performance of students in the subject at every level of education, as well as low enrolment ratio in higher institution both for mathematics as a course and other related subjects is a concern to education stakeholders, researchers and even

students themselves. The teaching of Mathematics in schools develop in the individuals the ability to explain reality, predict reality, and make decisions about the reality of the time to proffer solutions to problems that arise in the day-to-day living. Mathematics, being a core subject has its application in every other subject.

There is also the locational problem of schools. Some schools are located in the urban while some are in the rural settlements. Rurality is synonymous with depravity. Students in rural schools are, therefore, deprived of sound teachers, electricity supplies, pipe-borne water and other facilities and amenities that would enable them enjoy the rich tapestry of life. The location of a school can predict or determine teachers' teaching effectiveness and students' achievement in Science. The location of a school has a significant effect on teaching effectiveness and academic performance of the students. Since teaching effectiveness could have effect on both teachers' and students' proficiency, environmental factors such as school location (rural or urban) could also have effect or impact on the proficiency or academic achievement of students.

School location is the physical environment which the school stands. In a bid to expand the frontiers of education to all the nooks and crannies of Cross River State, the State Government establishes public Secondary Schools in both rural and urban settlements. It is speculated that this rural-urban configuration of the State have a telling effect on the quality of intellectual ability of students in the State.

Despite government efforts to maintain standard in mathematics education, the goal is yet to be adequately achieved. Mathematics instructions have not been effectively managed to bring about the desired change in students in the society. It is based on this backdrop that the researcher is interested in investigating school location, knowledge of subject matter and effective classroom communication affecting teaching effectiveness of mathematics teachers in Calabar Education Zone of Cross River State, Nigeria.

Location of the school and medium of instruction could not influence the teachers' effectiveness to the extent to produce gender specific differences, which suggests that an effective teacher may remain so whether associated with rural or urban school. This trend is consistent with previous studies exhibiting similar outcomes (Raju, 2013).

Effectiveness of teachers, in most of the cases, may depend more on other factors than location or school context. These may include job satisfaction, teaching aptitude, attitude towards teaching, motivation etc. However, some other researchers have reported location of the school as having effect on effectiveness of teachers. Teachers working in urban schools were found to be more effective than those in rural schools (Shweta, 2013). Thomas (2012) revealed that the rural female teachers had secured comparatively better scores than the rural male teachers in teacher effectiveness.

Adeyemi (2013) asserted that reasons for variations in teachers' teaching effectiveness are geographical locations (rural or urban), resources, availability of technology and quality of teachers. In other words, students tend to learn and perform better in an educationally stimulating environment that is likely to arouse a higher degree of interest. Adeyemi found that there was significant main effect of school location on teachers' teaching effectiveness in Economics. To buttress this, Adeyemi also found that rural schools are typically less active than urban schools in the United States of America, although with some variation between states and countries. They claim that there is a large Mathematics achievement gap between rural and non-rural areas, although some rural areas are above average and others are just average.

Similarly, Durowaju and Onuka (2015) investigated the effect of school location on teachers' teaching effectiveness in Economics in Senior Secondary Schools in Ibadan Metropolis of Oyo State, Nigeria. Three hypotheses were tested at 0.05 level of significance. Multi-stage sampling procedure was adopted in the study. Sixty schools (30 urban and 30 rural) were randomly selected. Consequently, 60 Senior Secondary Economics Teachers (30 urban and 30 rural) whose classes were used as intact class were involved in the study. Two instruments namely: Teachers' Teaching Effectiveness Enhancement Scale (TSES) was used to generate data for the study. The Reliability coefficients of the instruments were 0.79 and 0.74 respectively. Some of the findings were: school location had significant main effect on

teachers' teaching effectiveness in Economics. While school location had no significant interaction effects on teachers' teaching effectiveness and students' achievement in Economics. It was recommended that teachers should be exposed to teaching effectiveness program to enable them imbibe the spirit of teaching effectiveness in carrying out their assignments.

More so, Radha and Ujjwal (2018) investigated school location and teacher effectiveness: A self-report study on secondary school teachers. The study was conducted on 400 teachers of secondary schools in three selected districts in West Bengal. The teaching effectiveness was estimated by a self-rating scale, namely Teacher Effectiveness Scale (JTES) developed by Jayaramanna. The primary aim of the study was to explore the differences in teaching effectiveness of the secondary school teachers in terms of their gender, locality of the schools and their designation.

The location of a school can predict or determine teachers' teaching effectiveness and students' achievement in Science. To corroborate this, Adeyemi (2013) submitted that the location of a school has a significant effect on teaching effectiveness and academic performance of the students. Since teaching effectiveness could have effect on both teachers' and students' proficiency, environmental factors such as school location (rural or urban) could also have effect or impact on the proficiency or academic achievement of students. According to Onuka and Emunemu (2010), schools that have provided generations of children and young people with knowledge, skills and attitudes need to become autonomous and responsive. Schools play a vital role in developing and sustaining rural communities and are crucial to Nigeria's sustainable growth and development. According to Nginah (2012), in the United States of America, rural means a small town having a population of twenty five thousand people and less, but in Nigeria, rural is rather defined by the amenities available or non-existent. Such amenities include electricity, good schools, pipe-borne water, motorable roads, and health

facilities, among others (Onuka & Emunemu, 2010).

Yusuf, Ajayi and Sofoluwe (2013) examined the influence of school type and location on teaching effectiveness in South West Nigerian secondary schools. A descriptive research of the survey design was used in the study. The sample consisted of 150 school principals. Stratified and simple random sampling techniques were used to select the sample. The data collected were analysed using frequency counts, percentages, means score, standard deviation and t-test statistical analysis. The research question was answered descriptively while the two null hypotheses formulated were tested at 0.05 level of significance. The study revealed that the teachers' effectiveness was low in the rural area and high in the urban. The study further revealed that there was no significant difference in teaching effectiveness between private and public secondary schools both in rural and urban areas. Based on the findings, it was recommended that government should not relent in the effort in sustaining best school plant planning in schools. This shows that the teachers' in the urban areas perform higher in their effectiveness than those the rural area, this could be as a result of availability of facilities.

Knowledge of the subject matter is essential for every teacher to have. This is because, for the teacher to convincingly earn the respect from his colleagues and students, he must demonstrate high degree of knowledge of his or her discipline. This view presupposes that such a teacher has got a sound academic training in the subject, has undergone a professional course in teaching and maintained a continuous academic growth.

In a study of 60 sciences (Mathematics inclusive) teachers from 20 secondary schools in old Owerri Local Government Area Njoku (2001) found that between 95% of the sampled teachers applied the wrong principles in one form or the other during the observed teaching of mathematics. This is dangerous for our educational system. Also Tsui and Cheng (2000) posit that teacher effectiveness includes three domains of subject competencies. One of which is the cognitive where the teacher builds a reservoir of knowledge of subject matter and skills for impartation of content to students. Adey (2005) opined that teacher understanding of the subject matter is basic to effective teaching.

Teacher education curriculum should contain a high percentage of knowledge of subject matter which the teacher is supposed to teach. In the same vein, the Nigerian education research council in a document published in 2004 stated that anyone who teaches (a subject) should know that subject, like it, continue to teach it and should be able to communicate well with the learner and understand its learning processes.

Bassey, Owan, Amansoa and Otu (2020) summarizes the view by saying that if education is to help students make sense of their environment and prepare them for the challenges of a technologically drive and an internationally competitive world, then it must be based on current knowledge. Available teachers must possess that knowledge and know how to transmit it to their students.

The need for communication is very obvious in any teaching-learning process, this is because the ultimate purpose of acquiring knowledge is to use it for communication. This can be done through the use of variety of teaching methods to help students understand the course content, clear presentation of material, giving practical work to support learning, speak clearly and loudly or write clearly on the chalkboard. Students at any level are deliberately being exposed to various forms of activities that lead to effective communication; they have to speak, write debate, argue and read. For students to accurately carry out the above tasks demands that the teacher himself must communicate effectively the desired learning experiences to the learners. Where this is lacking, we believe that learning might not be facilitated. This is why this study needs effective classroom communication as one of the attributes of effective teaching.

According to Agbi (2004) in the classroom, the basic elements in communication include the communicator, (the teacher), encoding (the language), message (the medium), decoding (interpretation), receiver (the students), feedback and noise (distraction). In simple terms, the teacher (communicator) has an idea (or message of instruction) to transmit to the receiver (student). To transmit the idea, the teacher must translate the idea into a meaningful form (encoding) and send the message by verbal or non-verbal means (medium). The message is received through the sense of the student (receiver) and translated into a meaningful form

(decoding). With a nod of the head, a facial expression, or some action, the student acknowledges whether understanding has been achieved (feedback).

Yoderu (2003) explored differences in perceptions or effective teaching of elementary education students in four countries-Finland, United States of America, Botswana and Zimbabwe. A random sample of teachers in training was used to rank 14 teacher characteristics which they perceived to have contributed towards making effective teachers. The result showed broad agreement among respondents on communication skills of the teacher with respect to effective and ineffective teacher. Observed disagreement was only reflected in areas of educational traditions, social and cultural contexts.

With the mathematics classroom, we may summarize the stages of effective communication/management as follows: the message, the curriculum or the topic originates in the mind of the curriculum designer who conceives what planned experiences are desired for the mathematics class; the message is encoded by the teacher and put into the mathematics lesson plan; the lesson is transmitted to the student through a well-articulated method, either through a discussion or demonstration with a chalkboard, a computer or other class members; the students for whom the message is transmitted, receive(s) it; The student (the receiver) decodes the message by trying to make meaning out of what has been communicated. Sometimes he/she own language or medium of understanding; and based on this understanding, he reacts and sends back a reply or a feedback to the sender to enable him knows whether the message has been grasped. (Yoderu, 2003)

The predominant communication in the classroom setting is oral communication. However, Uchegbue, Edet, Otu, Amalu, and Oyo-Ita (2021) in their study, found out that 85% of the talk that went on in the classroom was done by the teacher and mostly through demonstration method. Teachers described, directed and explained, with very little time (15%) for student talk-back. Even when the students do talk, one

had to strain to call it communication. It was true that the students responded to questions, condensed the materials from text, and translated their experiments or field trips into the written words, but they did not typically and verbally communicate their feeling, interest and doubts to the teacher. They often tried perhaps inadvertently to communicate their feelings and uniqueness non-verbally and sometimes violently with attacks on school authority and inanimate objects. Flomodo (2007) therefore, indirectly advised educators that classroom communication should be shared time between teacher and student. This sharing should be in a fairly even proportion with allowance for greater student participation in class activity.

In the principles enunciated by Ntino (2004), indicated that communication is a process; communication is inevitable; communication is continuous. Other principles include that interpersonal communication occurs on more than one level, that self-concept is affected by interpersonal communication. If a teacher is therefore not communicating with his students based on the above principles, he/she is likely to run into several communication barriers. These barriers according to Cole (2000) are individual bias and selectivity, status differences, fear and other emotional overtones, lack of trust, verbal difficulties and information overload.

Aside from oral communication, another type of classroom communication is in a written form. It takes the form of chalkboard sketches, textbooks, visual aids and other written materials. The use of chalkboard is still indispensable particularly in developing countries like Nigeria, etc. Planned boards are yet not widely used in Nigerian schools, even universities, but they are very useful tools for display of pictures and other written materials (Onwuakpa, 2008). Onwuakpa recommends the following: the chalkboard should be mounted in a stationary position preferably on the wall in front of the classroom; it must be at a conspicuous position visible in all areas of the classroom, the board should always be neat and sightful. Teachers should use chalk that will give a sharp contrast and easy to the students' view, the teacher should write boldly and legibly. The chalkboard must be ruled to show the positioning

of the characters, teacher should avoid talking to the chalkboard ignore the students while writing on it. The teacher should face the students while explaining steps involved in calculation in mathematics, teachers should avoid blocking the students' view of the board while writing. The students will appreciate a good standing position outside the view of the written material.

Onwuakpa also added that for textbooks to be effective methods of communication especially in mathematics, these should be followed: the characters of the text must be legible and attractive; the language must be simple and easy to understand not in ambiguous form; the steps must be easy to follow and make reading and calculation enjoyable; the book must contain illustrations of pictures of mathematics like formula, graphs, charts and other concepts; there should objectives at the beginning of each chapter and a summary at the end; the text must contain review questions at the end of every example given and pages should be created for possible answers and their content must be rich and cover the syllabus fairly well.

Another method of communication is through eye contact, gestures, hands and body movement. These could be classified under what Basse (2006) called "Teaching as a performing Art". It is an activity in which the teacher acts out his part in the classroom with the intention of making a lasting impression on the students' mind. He changes the pitch and volume of his voice to have effect, he passes and stops, uses his hands and body movement to draw students attention. He pauses at crucial movements, cracks a relevant joke and throws sudden questions to keep his students in suspense. He attracts attention and conveys the message with effect such that at the end of the lesson his students look forward with expectation to come back to the next class for more. This method of communication is very good for mathematics class especially for those students who have phobia in mathematics.

These, combined with knowledge of subject matter, is what makes teaching effective. In a study of 100 teachers in two Local Government Areas of Akwa Ibom State, Etim (2005) found out that the level of communication

is significantly related to teacher effectiveness and teacher interaction with students. Students also perceived such teachers as effective in the following ways; they made room for two way communication and interaction between teacher and students; they adopted the formal and informal channel of communication where students had access to them in a less bureaucratic manner. This helped to solve problems, resolve conflicts, reduce tension, motivate students and generate love; and they adopted leadership styles that were less threatening but allowed free flow of information from subordinates (students) and colleagues.

Adelste (2006) stated that communication in the mathematics class is often done with tools that are visual. In today's world, the industrial sector is flooding the market with various tools of communication like the use of computer in solving mathematical problems. The Nigerian school system is, in most cases, operating without these tools. Classroom communication will be effective or enhanced if the school system is supplied with these tools hence the need of this study.

METHODOLOGY

The research design adopted for this study is ex-post facto design. The design, is suitable for this study because the researcher has no control over the independent variables since they have already occurred in the population. The study area is the Calabar Education Zone of Cross River State. The Calabar Education Zone is located between Latitudes $4^{\circ}28'$ and $6^{\circ}31'$ North of the Equator, and Longitudes $7^{\circ}50'$ and $9^{\circ}28'$ East of the Greenwich Meridian. The population for the study consists of all the 201 Mathematics teachers in Calabar Education Zone. The sampling technique used in this study is the purposive (census) sampling technique because the population was not large enough. The sample is made up of all 201 Mathematics teachers in the 72 public secondary schools in the Education Zone.

The instrument used for the study is titled "Teaching Effectiveness of Mathematics Teachers Questionnaire" (TEMTQ). The validity of the instrument was established by experts in Measurement and Evaluation Unit. To ascertain

the reliability of the research instrument, a trial test was conducted using 50 mathematics teachers drawn from the population outside the actual sample. Split-half method of reliability was used to determine the reliability estimate of the instrument. The scores derived from the two sets were correlated using Pearson's Product Moment Correlation and corrected with Spearman Brown prophecy formula. The reliability coefficient ranges from .78 to .85 which were considered high. The copies of the questionnaire were administered in each of the sampled schools with the help of two research assistants.

HYPOTHESES OF THE STUDY

The following two hypotheses were formulated to guide the study;

1. School location do not significantly influence teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication.

Mathematics teachers in terms of knowledge of subject matter and effective classroom communication in Calabar Education Zone of Cross River State are not significantly high.

PRESENTATION OF RESULTS

Hypothesis one

School location do not significantly influence teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication.

The independent variable in this hypothesis is School location which is categorized into two (urban and rural), while the dependent variable is teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication. To test this hypothesis, each of the two categories of School location was compared with the two dimensions of teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication using Independent t-test analysis. The result is presented in Table 1

TABLE 1: Independent t-test analysis of the influence of School location on teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication (N=201)

Teaching effectiveness	School location	N	\bar{X}	SD	t-value
Classroom management	Urban	119	38.87	2.97	12.80*
	Rural	82	33.26	3.11	
Effective classroom communication	Urban	119	36.92	3.18	10.76*
	Rural	82	32.63	3.26	

*Significant at .05 level, df = 199

The result of the analysis in Table 1 reveals that the t-value for classroom management (12.80) and effective classroom communication (10.76) are respectively higher than the P -value of .000 at .05 level of significance with 199 degrees of freedom. With this result, the null hypothesis that School location do not significantly influence teaching effectiveness of Mathematics teachers

in terms of knowledge of subject matter and effective classroom communication was rejected. This implies that school location significantly influence teaching effectiveness of mathematics teachers in terms of knowledge of subject matter and effective classroom communication.

Hypothesis two

The levels of teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication in Calabar Education Zone of Cross River State are not significantly high.

There is only one variable in this hypothesis, which is level of teaching effectiveness of Mathematics teachers; but there are two types of teaching effectiveness at focus in this study. These are knowledge of subject matter and effective classroom communication. The researcher reasoned that for a teacher's

$$\text{Thus, the Reference mean score} = \frac{(4+3+2+1)}{4} \times 10 = 25.00$$

Testing hypothesis 2 involved comparing the sample mean on each of the two levels of teaching effectiveness, knowledge of subject matter and effective classroom communication with the reference mean score of 25.00. The statistical technique deploy to do this comparison was the t-test of one sample mean (also known as population t-test). The results of the analyses are presented in Table 2.

TABLE 2: Population t-test analysis of whether the levels of teaching effectiveness of Mathematics teachers are significantly high (N=201)

Teaching effectiveness	N	Sample Mean	Sample SD	Reference Mean	t-value	Sig level
Knowledge of subject matter	201	37.6866	2.26854	25.00	79.31*	.000
Effective classroom communication	201	33.2935	4.11198	25.00	28.62*	.000

* $p < .05$; $df = 200$

The results of analysis presented in Table 2 show the mean and standard deviation of the levels of teaching effectiveness of Mathematics teachers on each of the two types of teaching effectiveness of Mathematics teachers and reference mean at focus in this study. The comparison of each of these sample means of 37.69 and 33.29 with the reference mean score of 25.00 yielded t-values of 79.31 and 28.62. The calculated absolute t-values for knowledge of subject matter 79.25 and effective classroom communication 28.59 are each higher than the p-value of .000 at .05 level of significant with 200 degrees of freedom. With these results, the null hypothesis is rejected in the two instances of knowledge of subject matter and effective classroom communication. This implies that the levels of teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication in

teaching effectiveness to be considered significantly high, his/her effectiveness level should be significantly higher than an average level represented by a reference mean score. This reference mean score was obtained by multiplying the average of the scores assigned to the four response categories of strongly agreed, agreed, disagreed and strongly disagreed for each of the items on the questionnaire by the number of items used to measure each type of the teaching effectiveness (which was 10).

Calabar Education Zone of Cross River State are significantly high.

DISCUSSION OF FINDINGS

The result of the first hypothesis revealed that school location significantly influence teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication in Calabar Education Zone of Cross River State. The finding are in line with the view of Adeyemi (2013) who asserted that reasons for variations in teachers' teaching effectiveness are geographical locations (rural or urban), resources, availability of technology and quality of teachers. In other words, students tend to learn and perform better in an educationally stimulating environment that is likely to arouse a higher degree of interest. The author also found that rural schools are typically less active than

urban schools in the United States of America, although with some variation between states and countries. They claim that there is a large Mathematics achievement gap between rural and non-rural areas, although some rural areas are above average and others are just average.

The result of the second hypothesis revealed that the levels of teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication in Calabar Education Zone of Cross River State are significantly high. The finding are in line with the view of Bassey, Owan, Amansoa and Otu (2020) who summarized the view by saying that if education is to help students make sense of their environment and prepare them for the challenges of a technologically drive and an internationally competitive world, then it must be based on current knowledge. Available teachers must possess that knowledge and know how to transmit it to their students. The need for communication is very obvious in any teaching-learning process, this is because the ultimate purpose of acquiring knowledge is to use it for communication. This can be done through the use of variety of teaching methods to help students understand the course content, clear presentation of material, giving practical work to support learning, speak clearly and loudly or write clearly on the chalkboard.

Uchegbue, Edet, Otu, Amalu, and Oyo-Ita (2021) in their study, also found out that 85% of the talk that went on in the classroom was done by the teacher and mostly through demonstration method. Teachers described, directed and explained, with very little time (15%) for student talk-back. Even when the students do talk, one had to strain to call it communication. It was true that the students responded to questions, condensed the materials from text, and translated their experiments or field trips into the written words, but they did not typically and verbally communicate their feeling, interest and doubts to the teacher. They often tried perhaps inadvertently to communicate their feelings and uniqueness non-verbally and sometimes violently with attacks on school authority and inanimate objects. Flomodo (2007) therefore, indirectly advised educators that classroom communication should be shared time between teacher and

student. This sharing should be in a fairly even proportion with allowance for greater student participation in class activity.

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study it was concluded that the levels of teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter, effective classroom communication and effective classroom management in Calabar Education Zone of Cross River State are significantly high. It was also concluded that school location significantly influence teaching effectiveness of Mathematics teachers in terms of knowledge of subject matter and effective classroom communication in Calabar Education Zone of Cross River State.

Based on the conclusions of the study it was recommended that the chalkboard should be mounted in a stationary position preferably on the wall in front of the classroom; it must be at a conspicuous position visible in all areas of the classroom, the board should always be neat and sightful. Teachers should use chalk that will give a sharp contrast and easy to the students' view, the teacher should write boldly and legibly. The chalkboard must be ruled to show the positioning of the characters, teacher should avoid talking to the chalkboard ignore the students while writing on it. The teacher should face the students while explaining steps involved in calculation in mathematics, teachers should avoid blocking the students' view of the board while writing.

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