



Paper Title: The analysis of relationship between instructional materials usage and the impact on Student`s Academic Achievements in Senior Secondary School Mathematics in Taraba state.

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ABSTRACT:

This study examined the analysis of the relationship between instructional materials usage and the impact on Student`s Academic Achievements in Senior Secondary School Mathematics in Taraba state, Nigeria. The study adopted simple survey design. A review of related literature to the study was carried out. Data collected and collated were based on a set of Scales in the Questionnaire Mathematics-Instructional Materials - Related Scales (MIMRS) consisting of twenty four (24) items and was administered to eighteen (18) public schools across the State; three LGA from each senatorial zone of the State, consisting of nine (9) LGAs with sample size of 900 students. These instruments were validated and found to be reliable at 0.89 and 0.91 respectively. One hypothesis were generated and tested at 0.05 significant level and Data were analyst using Chi-square and Spearman rank correlation Statistical Method through SPSS statistical Software computer package. The Null hypothesis was rejected and the alternative upheld. Findings revealed that there is significant strong positive relationship between instructional material usage and Students Achievement in senior secondary school Mathematics. Hence from the findings made, the researcher drew conclusion and made useful recommendations which he hope if adhere to, will help to stimulate and enhance academic achievement in senior secondary schools mathematics.

KEYWORDS: *Questionnaire, Student`s Achievements, Instructional Materials, Spearman rank correlation, Chi-square, SPSS.*

INTRODUCTION:

Over many decades, the use of mathematical techniques has been gaining a lot of grand in social and biological science and as well as in the field of commerce and management. In fact the exactness and precision of mathematical language, methods and concepts have made it possible to explore large areas of research in these subjects which remained hidden so far from the keen eyes of the researchers. Relentless time, one could say that mathematics is probably the most convenient shoulder to lean on for not just pure sciences but also subjects like commerce and economics. However, because of it`s important to the society, there is need to break a new ground to fashion out which ways the subject could be well understood by the

students to maximize their performances. Nevertheless, It is observed in decade(s) that secondary school student's achievement have been very low in their final examinations and class activities in the subject. The low achievement may not only be as a result of any changes in content of mathematics, but also lack of instructional materials usage by the teachers in delivering the content. Therefore the role of mathematics cannot be over-emphasized in life-like activities, students' academic achievement, Nation building and National deployment.

Mathematics Education in Nigeria seems to be passing through the furnace of transformation. This could be inferred from the efforts of the Mathematical Association of Nigeria (MAN) in the last few decades to popularize the teaching and learning of mathematics at all levels of instruction. Consequently, the mere knowledge of mathematical concepts without the corresponding knowledge of their application to real life seems to be fading away. This among other things has influenced human learning and challenged educators, especially in the area of mathematics education, to experiment with innovative instructional methods for core curriculum across all levels of educational system. In Nigeria, mathematics has continued to be one of the core subjects at all levels of education so that, every child will acquire appropriate mathematical skills and knowledge to solve human problems in all spheres of life (Nigerian Educational Research and Development Council [NERDC], 2008). Learning and understanding of some mathematics topics have not only been frustrated by the nature of the topics but also by clumsy methods and instructional materials used (Etukudo, 2000; Etukudo & Utin, 2006). The resultant effect is the poor achievement level of students both in internal and external examinations. In view of this, Iji (2002) in trying to find solution to this ugly situation of poor performance in mathematics in public examination identified teaching techniques by the teachers as one of the contributory factors. This point to the fact that good teaching helps the learners to learn more qualitatively and quantitatively and poor teaching

would lead to poor learning and poor performance. One may associate this poor mathematics achievement by Nigerian students to some pedagogies adopted (Salau, 2002). He lamented on poor achievement of students in mathematics and points out that introduction of suitable instructional materials and methods are the likely solution. Literature and available records have shown a variety of efficacious innovative teaching strategies that have been identified by researchers to alleviate this problem of poor performance of students in mathematics, but their performance continues to deteriorate year after year. However, none of these research efforts has sought solution to this problem from the dimension of using student-centred and home-based activity approach to teaching- which is Problem based learning (PBL). According to Shaibu and Usman in Kurumeh (2006), involvement of students in the teaching and learning process which means a departure from the traditional methods of teaching is another means of ensuring active learning in science and mathematics. The call for a departure from traditional methods of teaching with its attendant poor performance indices has been sounded by researchers (Okebukola, 2002; Iji, 2005; Etukudo & Utin, 2006; Abakpa, 2011; Mtsem, 2011). This is with the intension of obtaining admirable results. However, this departure cannot come only through such means as Computer Assisted Instruction, Mastery learning, Logo and Basic Instructional Packages as well as Contextual Strategy in teaching mathematics. There is still poor performance of students in public examinations yearly. Thus, research on instructional strategies that will improve the quality of learning of mathematics has continued to generate interest among mathematics educators and scholars as the conventional method has failed to meet the learners' needs. The implication of these lapses identified in the conventional teaching method is that non-traditional teaching methods that will improve students' achievement have to be explored. The low achievement in mathematics by the students has been a source of concern to the public and mathematics educators in view of importance attached to mathematics as a veritable tool for the overall development of the individuals and the society at large. Reports on various teaching techniques indicate that they improve students' learning and

achievement. Yet results from public examination bodies on students' achievement are low. Thus, the need to explore other strategies that may enhance students' achievement in mathematics. As students become increasingly poor in mathematics achievement test, they are less inclined towards a learning approach which requires them to be self-directed and motivated. Mathematics should be ideal for students working in groups and can benefit them as they are more likely to brainstorm and come up with ideas and thoughts before they reach possible solutions.

Instructional materials are essential and significant tools needed for teaching and learning of basic science to promote teacher's efficiency and improve students' performance in basic science. Instructional materials make learning more interesting, practical, realistic and appealing. They also enable both the teachers and students participate actively and effectively in lesson sessions. Ibeneme (2000) defined teaching aids as those materials used for practical demonstration in the classroom situation by students and teachers. However, this study is aimed at finding out the effect of the relationship between the use of instructional materials on students' achievement in mathematics at the senior secondary school level.

Problem Statement/Justification:

One of the major problems facing education sector in Nigeria is the low level of the performance of secondary school students in both local and standardized examinations. It has become a great concern for researchers, educators and all education stake-holders over the years. It was observed that students usually fail in examinations owing to improper teaching methods and lack of essential teaching aids for instructional delivery. (Afolabi, 2009). This study therefore deemed it necessary to look specifically into the contributions of instructional materials to academic achievement of secondary school students in Mathematics.

Mathematics as the bedrock of all scientific and technological advancement is a pre-requisite to almost all courses in colleges of education, polytechnics and universities. Mathematics is a human invention, borne out of human mind, resolve to solve human problems. Thus as a creation of mind, it is concerned primarily with ideas, process and reasoning. Of all the factors that affect teaching-learning in the educational system of any society, non-usage of instructional materials seem to constitute the primary issue. Perhaps, the non-consideration of teachers qualification among others seem not to have brought about an effective teaching-learning, and could have resulted in students' poor achievement in WAEC and NECO examinations. It is surprising that despite the efforts of government, to improve the standard of education by providing the required human and material resources for the implementation of education at all levels, students' performance in Mathematics in internal and external examination is very poor in recent years. This situation makes one to wonder what could be the causes of this persistent failure of students in mathematics examination. Some scholars attributed this high failure rate in mathematics to various factors which could be institutional and non-institutional. Hence, the need to adopt a better teaching method that would positively influence candidates' achievement is needed. Therefore, the problem to be investigated in this study posed as questions are: Would students improve upon their achievement in mathematics if teacher's usages of instructional materials is considered? In support Okolie, Elom and Inyiagu (2014), observed that poor performance of students in basic science (mathematics) has been so high in many Nigerian public schools in the recent years due to lack of instructional materials usages. If this is not checkmated, our Science and Technology related subject graduates from the post-primary schools may not be employable and those who may further in their University Education may experience difficulties because of their background. Consequently, our educational system will not attain its objective of producing qualified and competent product in science education. Slow learning, low enrolment, dropouts and poor attention span a poor performances in SSCE are the focus of the problems for this

study. The problems listed above motivate the researcher's decision to investigating if the predominant problems could be attributed to lack of teacher's usage of instructional materials in teaching in school. The problem which this study intends to solve, is what then is the impact of teachers' instructional materials usage on mathematics students' academic achievement in Taraba State-Nigeria?

Objective of the Study:

The study examined the relationship between Teachers instructional materials usage in teaching and students' academic achievement in senior secondary school mathematics.

Significance of the Study:

The study is mainly focused on the relationship between Teachers instructional materials usage in teaching and students' academic achievement in senior secondary school mathematics. It is hoped that, the study would help the educators, government, industries, and curriculum planners toward holistic realization of the student's potentialities in school. They will understand the significant of the use of instructional materials for optimum academic achievement. Parents will use the knowledge of the results to involve and advise their children and wards at home in terms of scheduling engagement and responsibilities for them. Mathematics teachers and counsellors would also be assisted by the outcome of this study to sequence academic activities and the attainment of the school goals. However, mathematics teachers will be armed with the requisite information about the various factors that influence students' academic performance and foster ways to enhance students' interest in the teaching and learning process. Also to improvised adequate teaching and learning equipment for the effective teaching and learning of mathematics.

Once more, findings from this study maybe of utmost importance to educational and curriculum planners because it would act as a feedback or evaluation to the curriculum implemented, to ascertain if the required experience, expertise, qualification stated for entry into secondary teaching, meets the educational needs of the learners, to make further prescription or better analyse the effects of teachers attitudes on students' Academic performance.

Finally, it will be of great importance to future researchers who would seek reference on recent literature review and to give an up to date analysis on the research topic and equipment for teaching and learning of mathematics.

Research question:

To what extent does the use of instructional materials relates to student's achievement in senior secondary school Mathematics?

Research hypothesis:

In order to achieve the purpose of this study, this hypotheses is formulated to guide the researcher.

There is no significant relationship between the usage of instructional materials and student's achievement in senior secondary school Mathematics.

Scope of the study:

This study is however delimited to senior secondary students (SS2) in eighteen (18) public schools across the State; three LGA from each senatorial zone of the State, consisting of nine (9) LGAs in Taraba state in North-Eastern part of Nigeria.

Review of related literature:

The reviews of related literature focus on the following sub-headings:

- (i) Objectives of senior secondary school general mathematics.
- (ii) Taxonomy of educational objectives
- (iii) Concept of equipment/ instructional materials
- (iv) Students' perception of mathematics and academic achievement.

Objectives of senior secondary school general mathematics:-

Apart from the general aim of secondary school education in Nigeria which is geared towards education preparing individuals for useful living in the society and higher education as important in:

(i) Providing trained manpower at sub professional level in applied sciences, technology and commence;

(ii) Inspiring students' with a desire for self-improvement and academic excellence;

(iii) Providing technical knowledge and vocational skills necessary for agricultural, industrial, commercial, and economic development.

The Federal Republic of Nigeria (FRN) (2006) specified the objectives of the senior secondary school general mathematics curriculum to include the test of the following:

- (i) Habit of effective and reflective thinking;
- (ii) Communication through symbols, expression and graph;
- (iii) The ability to distinguish between relevant data;
- (iv) Computational skills;
- (v) The ability to recognize word problems and translate them into mathematics expressions before solving them with related mathematics knowledge;
- (vi) The ability to be accurate to a degree relevant to the problem at hand;
- (vii) Precise, logical and abstract thinking.

Taxonomy of educational objective:

According to Bloom (1956) in Esu, Eukoha and Umoren (2006), the major categories in educational objectives is the Taxonomy of abilities and skills that can be ranked from simple to complex beginning from memory, comprehension, application, analysis, synthesis and Evaluation. These stages are developmental because it is only what one understands, that he can apply.

Cognitive objectives are those objectives, which emphasize remembering or reproducing something, which has previously been learnt. They also include objectives which have involve the solution of some intellectual problems for which the individual has determined the essential problems and recorded the materials or combined it with some ideas, methods and strategies.

According to Krathwohl (1964) in Esu, Eukoha and Umoren (2006), the major categories in the affective domain of the taxonomy of educational objective includes receiving, responding, value, organization and the characterization by a value or value complex. The affective domain includes the objectives which emphasize tone, emotion, or a degree of acceptance or rejection. They vary from simple attention to selected phenomena to complex, but internally consistent qualities of characters and conscience.

A large number of such objectives in our educational literature are expressed as interest, attitude, appreciation, values, emotional sets and biases.

Sampson (1966) in Esu, Enuokoha and Umoren (2006) opined that, the major categories in the psychomotor domain of the taxonomy of educational objectives include the following: perception, set, guided responses, mechanism, complex overt responses and origination.

The psychomotor domain expresses objectives which emphasize muscular and motor skills, some manipulations of objects or some acts that requires neuromuscular co-ordination.

Such objectives when found on our educational literature are related, to handwritings speech, physical education as well as trade and technical courses.

Values of Taxonomy of Educational objective:

- (i) It makes for a tightening of the languages of educational objectives such that, the objectives give direction to the learning process and determine the evidence to be used in appraising the effect of the learning experience.
- (ii) It enables authors of educational objectives to know exactly what they mean and the learners to equally have a clear view of what is intended.
- (iii) It provides a convenient system of describing and comparing test items, examination technique and evaluation instruments.
- (iv) It makes possible for the compression and studying of educational problems as well as serve as a tool clarifying and organizing educational research results:
- (v) It envision the possibility that we select the principle of classifying educational outcome which will reveal a real order amongst those outcomes.

Secondary school students' perception of mathematics and academic achievement:

Perception according to Monbipon (1986) refers to an innate feeling which leads to the development of attitude. He asserts that, attitude formation is built on already existing perception about a person, a thing or an event.

Relating perception to learning of mathematics, Monbipon (1986) in Fredrick (1980), asserts that students perceived mathematics from several influences, He pointed that students' perception of mathematics could be based on experience, age, other student perception, societal perception and surrounding learning circumstances.

Monbipon (1986) in Fredrick (1980), assert that perception based on experience occur in an instance where a students after being taught mathematics using the available resources and skills could not still understand mathematics. He asserts that is generally not out of place for

such a students to come to a conclusion that mathematics is difficult. He asserts also that they cannot understand mathematics no matter how much they try.

Itah (1991) opines that perception is an inner feeling drawn after an experience through the senses. He asserts that we perceive by touching, seeing, smelling. he posits that most school children live on assumption that certain subjects are difficult, but the number of students who really perceives the school subject and concludes on its difficulty, is the number of students who took time to time to encounter the subject through experiences. He contends that perception instigates other innate feelings and hence becomes motivator. He maintains that a positive perception generates interest and inculcates positive attitude in students while a negative perception generates stress, fatigue and discourages participation. He also asserted that for which most school children perform poorly in mathematics is because their perception of mathematics is poor and built upon fear of event encountering the subject to see its level of difficulty.

Falowiyo (1989) contends that most students' perception of mathematics is determined by students' experience from school variables. Notably among these variables is the teacher factor. He maintained that an unqualified mathematics teacher with poor teaching methods will tend to make students have negative perception of mathematics.

In study with 250 students in Oyo State, he found that interest and perception has a direct relationship. He maintained that the level of interest a school child has on a school subject or a classroom activity depends on his/her perception of that subject or class activity.

Jackson (1984) posits that meaningful learning is determined by the level of readiness of the learner. He opined that students' readiness must be in line with physical and psychological readiness. He contends that a child seated quietly in a class could be seen to be physically ready to learn but his psychological readiness depends on his anticipation and emotion at that point in time. He maintained that student's perception out-weighted other psychological factors like emotion fear. He asserts that this position was taken based on his findings that perception makes students to draw certain conclusion about a school subject and that when it is done, it becomes difficult for the child to depart from such conclusion.

Concept of instructional materials

Instructional materials can be considered as a consciously planned programme for the improvement and consolidation of instruction and for effective teaching and learning.

Ughamadu (1992) defined instructional materials as the resources that the teacher and students uses to influence and increase the effectiveness of teaching and learning process. It is this creative use of the materials by the students which will make them learn and improve their performance of skills that they intend to develop.

Nnoli (2008) stated that instructional materials are the resources that the teacher and students uses to influence the effectiveness of teaching and learning process. It is the creative use of the students' mental ability which will make them learn and improve their performance of the skills that they intend to develop. Furthermore, instructional materials or teaching aids means materials which aid teaching of a particular subject. This does not do the whole teaching on its own only, but by the methods. It is been administered by the model and controlled by the model which is the teacher who directs and controls the process.

It is an intrinsic part of teaching and learning process. The achievement of the aims and objectives of education depends primarily on instructional materials. Kay (2001) further opined that instructional materials are the things which are intended to help the teacher to teach more effectively, or better still which enables the students to learn more readily.

Egwu (2008) defined equipment/instructional materials as audio visual materials or as innovations that aid easy understanding in the teaching and learning process. This involves the use of human efforts, appropriate choice design and utilization of objects to ensure effectiveness. Equally, it is defined as anything (human effort, hardware, software, improve materials) used to satisfy and meet educational needs of the learners. It is an instructional device or technique or an expert brought into the teaching and learning interaction process to facilitate sharing of experience, knowledge, skills, attitudes and values.

Akpan (2000) stated that equipment/instructional materials are however, alternative channels of communication used by adult educators to concretized teaching of subjects, problem

concepts and educational objectives to ensure better understanding. Again, the use of instructional materials helps to increase the interest and satisfaction of the student.

Oshibodu (2004) sees instructional materials as materials used to facilitate teaching and learning by way of saving the instructor's time and effort by providing a way of capturing learner's interest, promoting effective retention of subject matter learned, a way of keeping students focused, active and of stimulating imagination. Kofar (1999) defined teaching using instructional materials as veritable channels of passing knowledge in the classroom. Instructions given in the form of practical work improve the learner's level of understanding. These are the resources that the teacher uses in presenting his lesson so that the students can easily understand and grasp what is being taught. It is a means of making the teaching and learning process more meaningful, effective, productive and understandable. The end result is the attainment of educational goals.

Eya (2004) believed that equipment/instructional materials stimulates the teacher's interest, and helps both the teacher and the learners to overcome the physical limitations of the teaching and learning process. As a system, it cannot be separated from classroom teaching otherwise, it could paralyze the entire system or process when neglected. The use of instructional materials is often bogged down by teaching problems such as inadequate materials, economic recession and relatedness of the educational resources; the student population explosion and accessibility of local materials network.

Okorie (2010) stated that improvisation is the sourcing, selection and deployment of relevant instructional elements of the teaching and learning process in the absence or shortage of standard teaching and learning resources for meaningful realization of specified educational goals and objectives. It is an act of using materials obtainable from the local environment or designed by the teacher or with the help of local personnel to enhance instruction. Most of the

teachers still do not teach with instructional materials on the excuse that they are not readily available.

Emezie (2010) stated that instructional materials include those materials and services used in learning situations to supplement the written or spoken word in the transmission of knowledge, attitude and ideas. It is a material that facilitates teaching and learning activities and consequently the attainment of the lesson objectives. It helps in making teaching and learning real and meaningful.

Instructional materials are essential and significant tools needed for teaching and learning of school subjects to promote teachers' efficiency and improve students' performance. They make learning more interesting, practical, realistic and appealing. They also enable both the teachers and students to participate actively and effectively in lesson sessions. They give room for acquisition of skills and knowledge and development of self- confidence and self- actualization. Ibeneme (2000) defined teaching aids as those materials used for practical and demonstration in the class situation by students and teachers. Ikerionwu (2000) saw instructional materials as objects or devices that assist the teacher to present a lesson to the learners in a logical and manner. In his own standpoint, Fadeiye (2005) saw instructional materials as visual and audio-visual aids, concrete or non-concrete, used by teachers to improve the quality of teaching and learning activities in Social Studies. Agina-Obu (2005) submitted that instructional materials of all kinds appeal to the sense organs during teaching and learning. Isola (2010) also described instructional materials as objects or devices that assist the teachers to present their lessons logically and sequentially to the learners. Oluwagbohunmi and Abdu-Raheem (2014) acknowledged that instructional materials are such used by teachers to aid explanations and make learning of subject matter understandable to students during teaching learning process. In the same vein, Obanya (2004) asserted that several studies carried out in some areas in Nigeria indicated that the results of Senior School Certificate Examinations was completely

bad in nearly all subjects offered by the students. He stressed further that only about 10% of candidates 'meaningfully passed' the examination. Abdu-Raheem (2011) asserted that non availability and inadequacy of instructional materials are major causes of ineffectiveness of the school system and poor performance of students in schools. Ahmed (2003) confirmed that in most secondary schools in Nigeria, teaching and learning take place under a most un-conducive environment without access to essential materials. Eniyewu (2005) posited that it is very important to use instructional aids for instructional delivery to make students acquire more knowledge and to promote academic standard. Nevertheless, Ajayi and Ayodele (2001) stressed the importance of availability of instructional materials to achieving effectiveness in educational delivery and supervision in the school system. Ogbondah (2008) cautioned on the gross inadequacy and underutilization of instructional materials necessary to compensate for the inadequacies of sense organs and to reinforce the capacity of dominant organs. He noted that school teachers should try their possible best in the provision of locally made materials in substitution for the standard ones to promote their lessons. Enaigbe (2009) noted that basic materials such as textbooks, chalkboard and essential equipment like computer, projector, television and video are not readily available in many schools. In Olumorin, Yusuf, Ajidagba and Jekayinfa (2010) observed that instructional materials help teachers to teach conveniently and the learners to learn easily without any problem. They asserted that instructional materials have direct contact with all sense organs. Kochhar (2012) supported that instructional materials are very significant learning and teaching tools. He suggested the needs for teachers to find necessary materials for instruction to supplement what textbooks provide in order to broaden concepts and arouse students' interests in the subject. According to Abolade (2009), the advantages of instructional materials are that they are cheaper to produce, useful in teaching large number of students at a time, encourage learners to pay proper attention and enhance their interest. However, Akinleye (2010) attested that effective teaching and learning requires a teacher to teach the students with instructional materials and use practical activities to make

learning more vivid, logical, and realistic and pragmatic. Esu, Enukeha and Umoren (2004) agreed that instructional materials are indispensable to the effective teaching and learning activities. Ekpo (2004) also supported that teaching aids are always useful in supporting the sense organs. Despite the fact that instructional materials are essential tools that can make learning practical and knowledge acquisition easier, they are not readily available in Nigerian secondary schools leading to low level of performance of learners in government examinations (Abdu-Raheem 2014). According to Josua in Abiodun-Oyebanji and Adu (2007), instructional materials are all things that are used to support, facilitate, influence or encourage acquisition of knowledge, competency and skills. Abdu-Raheem (2014) encouraged teachers to improvise teaching aids because they are in great measure enhance learners' full participation in the lesson, gives room for inquiry, problem-solving, discussion and clarification of issues and ideas among students and the teacher. Riveire (2006) noted that improvisation is a valuable teaching tool. Afolabi and Adeleke (2010) identified non-availability, inadequacy and non-utilization of learning materials as a result of teacher's poor knowledge as factors responsible for the use of lecture method. They recommended that both students, teachers, parents, Parents/Teacher Association, government and philanthropists should be involved in improvising instructional materials for the teaching and learning in schools. Therefore, Ogbondah (2008) advocated for of teachers' resourcefulness and also encouraged them to search for necessary instructional materials through local means to supplement or replace the standard ones. Oso (2011) also agreed that the best way for teachers to make use of their manipulative skills is to improvise so as to achieve their lesson objectives at least to a reasonable extent. Jekayinfa (2012) also identified the importance of improvisation of instructional materials as making learning concrete and real, substitutes one thing for another, allows the students to participate in the production of materials, economical and more teacher-student resource oriented. Abdu-Raheem (2014) submitted that improvisation of locally made teaching aids could assist to improve quality of graduates turn out from schools and standard of education generally. Abdu-

Raheem and Oluwagbohunmi (2015) also corroborated the idea that resourceful and skilful teachers should improvise necessary instructional materials to promote academic standard in Nigerian schools.

Material and Methods:

Study Design: The study adopted simple survey design. Data collected and collated were based on a set of Scales in the Questionnaire Mathematics-Instructional Materials - Related Scales (MIMRS) consisting of twenty four (24) items and was administered to eighteen (18) public schools across the State; three LGA from each senatorial zone of the State, consisting of nine (9) LGAs with sample size of 900 students. These instruments were validated and found to be reliable at 0.89 and 0.91 respectively. One hypothesis were generated and tested at 0.05 significant level.

Statistical Analysis: Data were analysed using Chi-square and Spearman rank correlation Statistical Method through SPSS statistical Software computer package version 21 to test for the relationship between the dependent and independent variables at level $p < 0.05$ considered as the cut off value for significance.

Description of study area: The area for this research was consist of six (9) local Government areas which includes Bali-Wukari-Takum-Donga-Jalingo-Gassol-Zing-Ardo-kola-Gashaka-LGA. Three from each senatorial zone of Taraba State.

Results:

Hypothesis Ho:

There is no significant relationship between instructional materials usage and student's achievement in senior secondary school Mathematics.

Table 1: Chi-square Analysis on the relationship between instructional materials and the effective teaching and learning of Mathematics students' Academic Achievement.

S/N	Affirmative (SA+A)	Decline (D+SD)	TOTAL	DF	X ² -Cal	X ² -Crit.	Level of sign.	Decision	Instructional materials
6.	140	40	180	4	40.6248	9.488	0.05	Rejected	Charts/Diagram
7.	150	30	180						Drawing
8.	105	75	180						Mathematical Set
9.	145	35	180						Shapes
10.	120	60	180						Chalk Board
Total	660	240	900						Others

Source: SPSS version 21 Computation (2023)

The table above shows that the X² Calculated value of 9.017 is the higher than the X² Critical value of 9.488 at 0.05 level of significance. The null hypothesis was rejected. This implies that there is a significant relationship between instructional materials and the effective teaching and learning of Mathematics students' Academic Achievement.

Table 1.2 Mean Score of Level of Utilization of instructional Materials and Students Mathematics achievement.

	Mean	Standard Deviation	N
Instructional Materials	58.8	1.942	900
Mathematics Achievements	62.25	8.8741	900

		Instructional	Achievement
Instructional Materials	Pearson Correlation	1	0.8897
	Sig.(2-tailed)		0.000
	N	900	900
Achievement	Pearson Correlation	0.8897	1
	Sig.(2-tailed)		0.000
	N	900	900

Source: SPSS version 21 Computation (2023)

Table 1.3 shows that there is significant Strong positive relationship between Instructional Materials usage and Academic Achievements in Mathematics. This implies that, The Instructional Materials have positive impacts on Academic Achievements of senior secondary school students in mathematics.

The investigation using Pearson product moment correlation shows a Strong positive relationship between Instructional Materials effect on Academic Achievements [$r = 0.8897$, $N=900$, $P<0.05$]

The model is however significant at 5% alpha level such that the sig. value is 0.000 hence, the null hypothesis is rejected. It is therefore concluded that there is a significant relationship between the use of instructional materials and students' achievements in senior secondary school mathematics.

DISCUSSION OF FINDINGS:

From the analysis of results, the study reveals that there is significant relationship between the use of instructional materials and students' achievements in senior secondary school mathematics.

Form the finding above, the hypothesis stating that there is no significant relationship between there is no significant relationship between the use of instructional materials and students' achievements in senior secondary school mathematics is rejected. The result shows a significant relationship and this indicates the alternative hypothesis that, there is strong positive relationship between the use of instructional materials and students' achievements in senior secondary school mathematics.

The hypothesis revealed that there is a significant relationship between instructional materials and the effective teaching and learning of Mathematics students' Academic Achievement. This means that instructional materials when effectively utilized has positive effect on student's achievement in Mathematics. This finding is in agreement with Uline and Megan (2008) and Okpala, (2019) confirmed a strong and positive relationship between quality of school instructional materials and student achievement. This is supported by Danmole and Abdullahi (1990) who emphasized the importance of improving instructional strategies through the use of teaching aids. Instructional materials that facilitate effective teaching and learning and also promote students' performance. The inadequacy of these facilities has been noted many years back and still persists particularly with the overcrowding classes. This also shows that instructional materials and its utilization relates positively to effective teaching and learning of mathematics.

Recommendations:

Based on the above findings of this study, the researcher made the following recommendations.

1. The school Authorities, industrialists, parent's Government and private individuals should encourage the use of instructional materials in schools.
2. Curriculum planners should make the use of instructional materials in school compulsory at all levels of education.
3. This study recommends that since children taught Mathematics using instructional materials perform better than those who are taught mathematics using abstract mathematics symbols only, the children should be taught by use of instructional materials for better performance in mathematics.
4. Workshops on the use of and updates of instructional materials should be organized on regular basis for teachers since knowledge gain is a continuous process and knowledge grows in itself.

5. Government and Ministry of Education should encourage teachers to use manipulative to help teach mathematics thereby positively affecting student learning. Incorporating manipulative into mathematics lessons in meaningful ways helps students grasp concepts with greater ease, making teaching most effective.

Suggestion for the further study

Based on findings and the scope of this study, the researcher recommends further studies to be carried out in the following areas:

- i. A replica of the study should be carried out within the secondary school context in other local Government areas to determine the impact of using instructional materials to teach mathematics when compared with only abstract mathematics symbols in order to improve achievement in mathematics in senior school Students.
- ii. A research study to be carried out in a different geographical region to determine the impact of using instructional materials to teach mathematics when compared with only abstract mathematics symbols in order to improve achievement in mathematics in primary school pupils.
- iii. A research study to be carried out to determine the impact of mathematics performance when taught using both instructional materials and mathematical symbols to teach mathematics in secondary school students.

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