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Effect of Audio Visual Instructional Media on Students' Interest and Achievement in Algebra in Katsina Metropolis of Katsina State

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Abstract: This work examined effect of Audio Visual Instructional Media on secondary school students' interest and achievement in Algebra in Katsina metropolis of Katsina state. The research adopted the non-equivalence, non-randomized control group quasi experimental design. Data were collected from a sample of 218 students comprising 117 boys and 101 girls from two randomly selected public Senor secondary schools in Katsina metropolis. Two research instruments, Algebraic Interest Questionnaire (AIQ) and Algebraic Achievement Test (AAT) and were used to gather data. The AIQ was a questionnaire consisting 15 items for the sampled pupils to tick as deemed appropriate to them while AAT was a researcher made instrument consisting of 25 items based on senior secondary school II scheme of work for four weeks. The items were objectives questions scored over 100 (4). The reliability coefficients of AIQ and AAT were 0.79 and 0.86 respectively. Data collected were analyzed using descriptive statistics of mean and standard deviation for answering the research questions and t-test at coefficient alpha level of 0.05 for testing the hypotheses. Major findings of this study includes: there was significant difference between the mean interest scores of experimental group exposed to Audio-visual instructional media and their counterparts in the control group and there was no significant difference between the mean achievement scores of male and female students exposed to Audio-visual instructional media. Based on these findings it was recommended that Mathematics teachers should be encouraged to use audio visual instructional media to teach mathematics.

Keywords: Audio-visuals, Instructional Media, Interest, Achievement, Algebra.

INTRODUCTION

Mathematics has been recognized as bedrock for successful functioning of all aspects of human endeavor and that no nation can achieve any measure of scientific and technological advancement without mathematics. The knowledge of mathematics is a basic pre-requisite in the quest for present day scientific and technological advancement. The idea of numbers, structures and relationships which mathematics connotes stand out in medicine, business, education, agriculture, and every field of human endeavour. In the 21st century in particular, sound mathematical background is needed for life sustenance and workplace competence. Mathematics is the queen of science and a tool for scientific and technological advancement, an indispensable tool for effective use of electronic resources for national development. It is also a way to communicate ideas, and perhaps more than anything, it is a way of reasoning that is unique to human beings. Olutosin (2007) described mathematics as an instrument to ease or facilitate the learning of other subjects and that, the importance of mathematics permeates all aspects of human endeavour.

In spite of great importance of mathematics in nation building, scientific and technological

development, it is still notable that students' performance in mathematics at internal and external examinations has remained considerably poor. Table 1 presents the result statistics of students' performance in West African Secondary School Certificate Examination (WASSCE) in mathematics from 2011 to 2020 in Katsina state.

Table 1: Students Performance in May/June WASSCE Mathematics (2011-2020) in Katsina State

Year	Total No. of Students	NO. of Students That Obtained Credit & Above(A1-C6)	% of Students With Credit & Above(A1 C6)	NO. of Students With (D7-F9)	% of Students With (D7-F9)
2011	36,798	478	1.30	36,320	98.70
2012	38,602	494	1.28	38, 108	98.72
2013	41,758	4,342	10.40	37,416	89.60
2014	43,065	4,421	10.27	38,644	89.73
2015	44,439	5,566	12.53	38,873	87.47
2016	20,404	7,790	38.20	12,614	61.80
2017	21,717	11,612	53.47	10,105	46.53
2018	23,916	7,188	30.06	16,728	69.94
2019	21,589	7, 276	33.70	14,313	66.30
2020	22,884	9,313	40.70	13,571	59.30
Total	315,172	58,480	231.91	256,692	768.09
Average	31,517	5, 848	23.19	25,669.2	76.81

Source: Test Development Division, West African Examination Council (WAEC) Lagos, Nigeria.

The overall performance in mathematics at the Senior Secondary Certificate Examination in Katsina state secondary schools has been poor as evidenced in Table 1. As the average percentage credit in mathematics was found to be 23.19 and the average percentage without credit is 76.81 which are more than 50% shows there are problem yet to be solved in mathematics. The search for explanation of students' poor performance in schools is far from being concluded as it remains one major controversial issue in education. Some the reasons for poor performance could be attributed to low utilization and sometimes non - availability of instructional materials (audio - visual aids in particular) for teaching of mathematics in schools, the pattern of teaching adopted by teachers today is mostly abstract in form, without been supported by the use of appropriate aids, inability to select appropriate audio - visual materials and sometimes its irregular use as support to the teaching of mathematics in classrooms by its teachers was observed to be a strong hindrance to students achievement. It is this note that this study aimed to find out the effect audio-visual instructional media on students' interest and achievement in algebra.

The materials like charts, maps models, concrete objects, film-strips, radio, television and projector etc. help a teacher in good communication, healthy classroom interaction and effective realization of the teaching objectives may be called instruction media in the field of teaching- learning. Instructional media are the devices which are used in the classroom to encourage learning and thereby make it easier and interesting. We sense the world around us by our sense organs such as by touching, seeing, smelling, hearing and tasting. The devices that are used for observations only are called visual media and those for listing purposes are audio- media. But the devices that can be used for seeing and listening simultaneously are known are audio-visual media. Audio-visual media and materials are not a substitute for good teaching. They are complementary media materials which assist the teacher in the communication process. Good teaching is an art but with all great artists, skills must be developed through practice, drill and hard-work. There is a saying that, "It is easier to believe what you see than what you hear; but if you both see and hear, then you can understand more readily and retain more. Audio-Visual Media help us not only to see things that are removed by space but also those that are

removed by time. Characteristics of Good Audio-Visual Instructional Media (AVIE): They are large enough be seen by the students, They are useful and meaningful, They are up to the mark and up to date in every respect, They are simple, cheap and may be improvised, They are handy and easily portable., They are according to the mental level of the learners, They motivate the learners, capture the attention of pupils and help in the realization of stipulated learning objectives lastingly and They are useful for supplementing the teaching process but they cannot replace the teacher.

Algebra is a branch of mathematics which treats of the relations and properties of quantity by means of letters and other symbols. It is applicable to those relations that are true of every kind of magnitude. (Webster's Dictionary, 1994) Algebra uses mathematical statements to describe relationships between things that vary. These variables include things like the relationship between the supply of an object and its price. When we use a mathematical statement to describe a relationship, we often use letters to represent the quantity that varies, since it is not a fixed amount. In adopting audio-visual media instruction to teaching and learning in Algebra class, other observed factors that can influence the students' participation in the instructional delivery process such as interest and gender need to be addressed.

Interest is an important variable in learning because when one is interested in an activity, one is likely to perform positively. Krapp and Prenzel (2011) describe interest as the feelings of an individual whose attention, concern or curiosity is particularly engaged by something. They averred that the concept of interest is directly related to attitude and motivation. That is the inner force or drive that propels a child to pay attention to every bit of instruction while learning. In this context, it is the zeal shown by pupils in learning concepts of algebra. Gender refers to the socially determined differences between woman and man such as roles, attitude, behavior, and values. Gender roles are learned and vary across cultures and overtime; they are thus amendable to change. Gender is a relational term that includes both woman and man. Gender equality focuses on changes for both man and woman (Vale,
2008).

In the past, some research works have been carried out on students' achievement and interest using audio –visual instructional materials to mathematics and other subjects some of which are reviewed below:

Lapada (2017) carried out a study to determine the effects of Audio-visual aided instruction on Grade 8 students and correlate their profile and attitudes to their academic performance in Science. The data were drawn using a self-structured achievement test for students' academic performance in Science and a survey questionnaire which included profile, attitude towards technology, media, study habits and motivational practices of the family. In terms of performance within each group, in experimental group, more students performed well while in the control group more students performed less compared to the rest of the group respectively. This further justified that audio-visual aided instruction is significantly more effective than traditional instructions to promote long-term retention of knowledge and skills acquired during the learning experience.

Anyagh and Abari (2019) determined the effect of Audio-visual technology on senior secondary school student's interest in geometry in Makurdi Local Government Area of Benue State. Quasi-experimental research design was adopted for the study and multi-stage sampling technique was used to select a sample 139 students. Results from the study revealed that students taught geometry using the audio-visual teaching approach showed more interest in geometry than those taught with conventional teaching approach. The study also revealed that both male and female students in experimental group indicated similar interest in learning geometry.

Sanni, Aransi and Adebayo (2019) examined the effectiveness of Audio-Visual Aids on students' academic performance in Iwo Local Government Area of Osun State, Nigeria. Three objectives and research questions were enumerated while two hypotheses were tested. Descriptive survey research design was employed. Simple random sampling technique was employed to select the sample of three-hundred (300) from five public schools in Iwo metropolis. The questionnaire was used as research instrument which was validated and undergone reliability test. Descriptive and inferential

statistics were used for data analysis. The empirical outcomes indicated that audio-visual aids are effective in increasing the understanding of students in senior secondary schools. Students were observed to be more attentive when audio-visual aids were played. Majority of students agreed that the use of audio-visual aids increase their interest to learn as well as ability to learn and remember the contents.

Adamu (2020) examined the effect of Audio Visual Aids in the teaching and learning of mathematics in selected secondary schools in Makurdi Metropolis, Benue State, Nigeria. The researcher used both primary and secondary sources from a sample of four hundred and forty three (443) respondents obtained by the use of a well-structured questionnaire. The data collected were analyzed using descriptive statistics such as Mean rating and Paired Sample t-test. The result of the analysis showed that there is no difference in the Mean difference in the responses of Male respondents compared to the female respondents and the result is statistically significant. The result also revealed that there is no significant difference between the mean responses of male and female teachers on the extent of use of audio visual aids in the teaching and learning of mathematics in selected secondary.

Therefore, this study investigated the effect of audio visual instructional media on students' interest and achievement in algebra in concepts of mathematics.

Statement of the Problem.

Evidence of poor performance in mathematics by secondary school students point to the fact that the most desired technological, scientific and business application of mathematics cannot be sustained. This makes it paramount to seek for a strategy for teaching mathematics that aims at improving its understanding and performance by students. Evidence are abound, that lack of mathematics teaching media and Mathematics teachers non-use of laboratory technique in teaching mathematics is one of the major factors that contribute to poor achievement in mathematics by
secondary school students. Therefore the study is designed to find out the effect of audio-visual instru ctional media on students' interest and achievement in algebra concept.

Objectives of the Study

The main objective of the study was to determine the effect of Audio- Visual Instructional Media on students' interest and achievement in secondary school Algebra. Specifically the purpose of study is:

1. To find out if there is difference in the mean interest of students taught Algebra with Audio- Visual Instructional Media and those taught without Audio- Visual Instructional Media.
2. To find out if there is any difference in the mean interest of male and female students taught Algebra with Audio- Visual Instructional Media
3. To find out if there is difference in the mean Achievement score of students taught Algebra with Audio- Visual Instructional Media and those taught without Audio- Visual Instructional Media.
4. To find out if there is any difference in the mean achievement of male and female students taught Algebra with Audio- Visual Instructional Media

Research Questions

The following research questions guided the study;

1. What are the difference in the mean interest of students taught Algebra with Audio- Visual Instructional Media and those taught without Audio- Visual Instructional Media?
2. What is the difference in the mean interest of male and female students taught Algebra with Audio- Visual Instructional Media?
3. What are the difference in the mean Achievement score of students taught Algebra with Audio- V isual Instructional Media and those taught without Audio- Visual Instructional Media?

4. What is difference in the mean achievement of male and female students taught Algebra with Aud io- Visual Instructional Media?

Hypotheses

The following null hypotheses were formulated and tested at an alpha level of 0.05 of significance.

Ho_1: There is no significant difference in the mean interest scores of students taught Algebra with Audio- Visual Instructional Media and those taught without Audio- Visual Instructional Media

Ho_2: There is no significant difference in the interest of male and female students taught Algebra with Audio- Visual Instructional Media**.**

Ho_3: There is no significant difference in the mean Achievement score of students taught Algebra wit h Audio- Visual Instructional Media and those taught without Audio- Visual Instructional Media

Ho_4: There is no significant difference in mean achievement of male and female students taught Algebra with Audio- Visual Instructional Media.

Delimitation of the Study

The study investigated the effect of Audio- Visual Instructional Media on students' interest and achievement in secondary school Algebra and Conventional Approaches on students' achievement in secondary school Algebra in Katsina metropolis of Katsina state. Specifically, the research was restricted to only two public secondary schools in Katsina metropolis. The study was limited to co-educational schools that have SSII class as at the time of this study. The reason for choosing this level of students is that, the students are not new to study of mathematics; they are stable not very close to writing of external examinations.

Methodology

Adopted for this study was quasi-experimental non-equivalent control group design, which makes use of pre-test, treatment and post-test. The reason for the adoption of this design is based on the fact that students in the class were taught with either Audio- Visual Instructional Media or Conventional method in other words; there was no randomization of the students for the treatment. Another reason is that quasi-experimental design offers less rigorous control compared to the other experimental designs.

The population of secondary school students in Katsina metropolis is numbering 247,587. The target population of the study consisted of all SSII students in Public Secondary Schools in Katsina

Metropolis of Katsina state numbering 45,763 (Department of Quality Assurance Katsina, Zonal Educational Office, 2021). Simple random sampling technique was used to select two public schools for this study. The schools sampled for the study are: Government Day Secondary School Kofar Yandaka and Government Day Secondary school Kofar Sauri. The two schools have four arms of SSII each and simple random sampling technique was used to select two arms from each school for the purpose of this research. Each arm in the selected school was randomly assigned to either experimental or control group. The experimental group comprised 57 male and 45 female students and the control group comprised 60 male and 56 female students, making a total of 218 students.

Intact class of SSII was used in each of the two schools to avoid distortion in their normal school schedules and classroom settings. Two research instruments were used for data collection. The instruments are Algebra Achievement Test (AAT) and Algebra Interest Questionnaire (AIQ). The (AAT) was used to measure the students' achievement in algebra while (AIQ) was used to measure students' Interest towards learning algebra.

The AAT was developed by the researcher based on SSII Mathematics syllabus covering the scheme of work for the topic Algebra. Twenty five (25) items were put together spread across all the behavioral objectives levels from knowledge to evaluation. Each of the 25 items was a multiple- choice objective question with four options (A, B, C and D). The AAT consisted of two sections:

section A, meant for general information about the students and section B, the achievement test. Time allowed was one hour while AIQ was consequently used and identified interest formed by the students towards learning and achievement in algebra through Audio visual Instructional media. The AIQ contained two major sub-sections; general information about the student/school and students' feelings, and confidence in using process oriented guided inquiry learning in algebra. A 4-point Likert Scale ranging from "Strongly Agree" (SA), "Agree" (A), "Strongly Disagree" and "Disagreed" was used. The AAT and AIQ were administered twice, before (pre) and after (post) the experiment. The first administration was to ascertain the level of students' algebra interest and ability before the treatment; the second was to determine the extent of students' algebra interest and achievement after the experiment.

The total score for the instrument was 100 marks. The Algebra Achievement Test (AAT) and Algebra Interest Questionnaire were content validated with the use of a Table of Specification in constructing the test items. Also, it was face-validated by the two experts in Mathematics department in Federal College of Education Katsina. The experts made useful suggestions that were taken into consideration and their observations were effected before the pilot testing. The AIQ and AAT were pilot tested with SSII students of which was not part of the main study with internal consistency of the instrument to be 0.79 using Cronbach alpha for AIQ and 0.86 using Kuder-Richardson (KR- 21) formula for AAT.

The researcher carryout the teaching for the two groups and the two classes each from the selected schools through their respective mathematics teachers (colleagues) as research assistants. The students in SSII of the selected schools were subjected to pre-test to ascertain their corresponding entry behaviors; after which the class was randomly assigned to treatment (method), the experimental group and control group. The students in the experimental group were taught using Audio visual Instructional media while the control group was taught with conventional teaching method without using Audio visual Instructional media.

During this period, the teachers make used of lesson plans prepared by the researcher and based on the principles of each teaching strategy to cover the algebra topics. The post-test (that is, the second version of AAT and AIQ) administered in the term when all groups would have covered the expected contents. The teacher distributes both instruments and gives the students one hour to solve them by ticking the correct answer. The researchers availed themself to the respondents for possible clarification and explanation. The contribution of the principal and mathematics teachers and the respondents at making the study a success appreciated. The AAT were being scored over 100 percent. Data collected were analyzed with respect to the research questions and hypotheses formulated for the study. Descriptive statistics of mean and standard deviation were used to answer the research questions while t-test was used to test for all the hypotheses at 0.05 level of significance.

Data Analysis and Results

Answer to Research Questions

Research Question One: What are the difference in the mean interest of students taught Algebra wit h Audio- Visual Instructional Media and those taught without Audio- Visual Instructional Media?

Table 2: Descriptive Statistics Showing Interest Mean Score of Experimental Group (AVIE) and Control Group in the Post test

Groups	N		SD
Experimental Group	102	3.61	1.83
Control Group	116	1.85	0.89
Mean Difference		1.76	

Results in table 2 indicate that students in the experimental group (AVIE) had interest mean score of 3.61 with a standard deviation of 1.83 while those in the control group had mean score of 1.85 with a standard deviation of 0.89. In other words the students in the experimental group had a higher attitude mean score of 1.76 more than their counterparts in the control group.

Research Question Two: What is the difference in the mean interest of male and female students taught Algebra with Audio- Visual Instructional Media?

Table 3: Descriptive Statistics Showing Mean Attitude Score of Experimental Group (AVIE) According to Gender

Groups	N		SD
Male	57	3.75	1.82
Female	45	3.47	1.74
Mean Difference		0.28	

Results in table 3 indicate that male students had an interest mean score of 3.75 with a standard deviation of 1.82 while the female students had an interest mean score of 3.47 with a standard deviation of 1.74. In other words, the male students had a higher interest mean score of 0.28 than their female counterparts in Audio- Visual Instructional Media.

Research Question Three: What are the difference in the mean Achievement score of students taught Algebra with Audio Visual Instructional Media and those taught without Audio Visual Instructional Media?

Table 4: Descriptive Statistics Showing Achievement of Students in Experimental Group (AVIE) and Control Group in Posttest

Groups	N		SD
Experimental	102	75.5	12.79
Control	116	51.0	15.34
Mean Difference		24.5	

Results in table 4 indicate that students in the experimental group (taught with Audio-visual instructional media) had an achievement score of 75.5 with a standard deviation of 12.79 while those in the control group had an achievement score of 51.0 with a standard deviation of 15.34. In other words, students in the experimental group had a higher an achievement score of 24.5 more than their counterparts in the control group.

Research Question Four: What is difference in the mean achievement of male and female students taught Algebra with Audio- Visual Instructional Media?

Table 5: Descriptive Statistics Showing Achievement of Gender in Experimental Group (AVIE) Scores in Posttest.

Groups	N		SD
Male	57	78.5	8.76
Female	45	72.5	7.56
Mean Difference		6.0	

Results in table 5 indicate that male students in the experimental group (AVIE) had a mean achievement score of 78.5 with a standard deviation of 8.76 while the female students had a mean score of 72.5 with a standard deviation of 7.56. In other words, the male students had a higher mean achievement score with a mean difference of 6.0 than their female counterparts in the experimental group.

Testing of Hypotheses

Four hypotheses were formulated and tested as follows:

Ho_1: There is no significant difference in the mean interest scores of students taught Algebra with Audio- Visual Instructional Media and those taught without Audio- Visual Instructional Media

To test for this hypothesis, t-test statistic was used and the results presented in Table 6.

Table 6: t-test Result In Respect of Mean Interest Scores of Experimental and control Groups

Groups	N	Mean	SD	df	t-value	Std. Error	Sig.@0.05	Decision
Experimental group	102	3.61	1.83	216	4.38	0.573	0.0000	Significant
Control	116	1.85	0.89					

Result in table 6 showed that there was significant difference between the mean interest scores of experimental group exposed to Audio-visual instructional media and their counterparts in the control group. As a result hypothesis was rejected. In other words, students from both groups differed significantly in their mean interest scores.

Ho_2:There is no significant difference in the interest of male and female students taught Algebra with Audio- Visual Instructional Media .

To test for this hypothesis, t-test statistic was used and the results presented in Table 7.

Table 7: t-test Result In Respect of Mean Interest Scores of Male and Female Students Exposed to Audio-visual Approach

Gender	N	Mean	SD	df	t-value	Std .Error	Sig.@0.05	Decision
Male	57	3.75	1.82	100	2.77	0.537	0.6541	Not Significant
Female	45	3.47	1.74					

Result in table7 showed that there was no significant difference between the mean interest scores of male and female students exposed to Audio-visual instructional media. On this basis therefore, hypothesis was not rejected. In other words, male and female students did not differ significantly in their mean interest scores as result of exposure to Audio-visual instructional media.

Ho_3: There is no significant difference in the mean Achievement score of students taught Algebra wit h Audio- Visual Instructional Media and those taught without Audio- Visual Instructional Media

To test for this hypothesis, t-test statistic was used and the results presented in Table 8.

Table 8: t-test Result In Respect of Mean Achievement Scores of Experimental and Control Groups

Groups	N	Mean	SD	df	t-value	Std.Error	P-Value	Decision
Experimental	102	75.5	12.79	216	14.54	0.476	0.0000	Significant
Control	116	51	15.34					

Result in table 8 showed that there was significant difference between the mean achievement scores of experimental group exposed to Audio-visual instructional media and their counterparts in the control group. As a result hypothesis was rejected. In other words, respondents from both groups differed significantly in their mean achievement scores.

Ho_4: There is no significant difference in mean achievement of male and female students taught Algebra with Audio- Visual Instructional Media.

To test for this hypothesis, t-test statistic was used and the results presented in Table 9.

Table 9: t-test Result In Respect of Mean Achievement Scores of Male and Female Students Exposed to Audio-visual Approach

Gender	N	Mean	SD	df	t-value	Std.Error	Sig.@0.05	Decision
Male	57	78.5	8.76	100	5.22	0.453	0.702	Not Significant
Female	45	72.5	7.56					

Result in table 9 showed that there was no significant difference between the mean achievement scores of male and female students exposed to Audio-visual instructional media. On this basis therefore, second hypothesis was not rejected. In other words, male and female students did not differ significantly in their mean achievement scores as result of exposure to Audio-visual strategy.

Discussion of Findings

The purpose of this study is to find out the effect of audio visual instructional media on secondary school students interest and achievement in Algebra in Katsina metropolis of Katsina state. Four research questions and four hypotheses were raised, means, standard deviation to answer the research questions while t-test statistics was used to test the hypotheses. Result in the table 6 shows that there was a statistically significant difference between mean interests of students exposed to algebra with audio-visual instructional media and those taught without audio-visual instructional media as $t = 4.38$, df= 0.573 $P<0.05$ The finding confirms that of Anyagh and Abari (2019) that students taught geometry using the audio-visual teaching approach showed more interest in geometry than those taught with conventional teaching approach. This also line with Sanni, Aransi and Adebayo(2019) students agreed that the use of audio-visual aids increase their interest to learn as well as ability to learn and remember the contents. The outcomes indicated that audio-visual instructional media are effective in increasing the understanding of students in secondary schools. Students were observed to be more attentive when audio-visual instructional media were played and by this develop more interest in learning of algebra than those in control group.

The result of t-test as reported in Table7 showed that there was no statistically significant difference between mean interests of male and female students exposed to algebra with audio-visual instructional media as t=5.22, df= 100, $P>0.05$. This implies that both male and female students in experimental group have similar level of interest in exposed to algebra with audio-visual instructional media. This confirmed Anyagh and Abari (2019) that both male and female students in experimental group indicated similar interest in learning geometry. This is possible because both genders show much interest to mathematics as a result of audio-visual instructional media since both were exposed to audio-visual instructional media at the same time their teachers did not allowed a particular gender to have more access to audio-visual instructional media than another. This could also be that in the presence of audio-visual instructional media students interest is aroused and sustained throughout the lesson periods.

The result of t-test as reported in Table 8 showed that there was significant difference between the mean achievement scores of experimental group exposed to Audio-visual instructional media and their counterparts in the control group taught without using audio-visual instructional media as t=14.52, df=216, $P< 0.05$. This mean teaching with Audio-visual instructional media approach was a significant factor on students' achievement in algebra. The finding of the study agreed with Lapada(2017) that students in experimental group taught with audio-visual aids, performed well than those in the control group This further justified that audio-visual aided instruction is significantly more effective than traditional instructions to promote long-term retention of knowledge and skills acquired during the learning experience.. The uses of audio-visual materials promote students' motivation in learning mathematics and enhances learning and re-learning among students as their academic achievement significantly improve their learning experiences.

Moreover, male students had a higher mean score than their female counterparts but the difference is not much. The result of t-test as reported in Table 9 revealed that there was no statistically significant difference in the mean achievement scores of male and female students exposed to algebra using audio-visual instructional media as t=5.22, df= 100, $P>0.05$. This is in line with Adamu (2020) that there is no difference in the Mean difference in the responses of Male respondents compared to the female respondents and the result is statistically significant ($p>0.05$). This is possible because the uses of audio-visual instructional media enable the teachers to arrest and sustains the attention of the students. Since both male and female students have equal access to audio-visual assisted instruction there is likely that they would perform equally in any given task. This could also be because the use

of audio-visual instructional media in teaching and learning made teaching interesting to both sexes of students and their teachers as well as creating better relationship in the classroom and promoting effective communication between the students and their teachers.

Conclusion

From the findings of the study the following conclusions could be drawn: students learn better through the uses of audio –visuals instructional media and hence achieved more academically, this allow improve their interest in the learning of algebra, especially at senior secondary school level.

However there is no significant difference in the interest and achievement of male and female students exposed to audio visual instructional media , this suggest that audio visual instructional media are beneficial to both genders, This is because in the cause of the lesson instructional media appealed to more than two senses of the students.

Recommendations

Based on the results and findings of this study, the following recommendations were made:

1. Mathematics teachers should be encouraged to use audio visual instructional media to teach mathematics.
2. For students to achieved better all forms of audio visual instructional media be used to teach mathematics to students at any level in secondary school education.
3. Teachers in training should be equipped with knowledge enough to implement audio visual instructional media in teaching mathematics.

REFERENCE

1. Adamu, G. (2020). Effect of audio visuals in the teaching and learning of mathematics in selected secondary schools in Makurdi metropolis, Benue state, Nigeria. *Int. Jr. of Mathematical Sciences & Applications, 10(1), 1-13*
2. Anyagh, P.I & Abari, M.T (2019)**.**Effect of audio-visual technology on senior secondary school students interest in geometry in Makurdi metropolis of Benue State. *Biomedical Journal of Scientific and Technical Research, 17(4), 12916-12921*
3. Krapp, B. E., &Prenzel. H. M. (2011). Flipping your classroom. *Learning and Leading with Technology,* 78(2), 10.
4. Lapada. A.A.(2017). Audio-visual aided instruction in science among high school students in the Philippines. *International Journal of Education and Research*. 5(7), 139- 156
5. Olutosin, L.O. (2007). Predictive Validity of Mathematics scores on Students' Achievement in Physics and Chemistry in senior secondary schools in Ijebu-Ode, Local Government Area. A Pre-field Research Proposal presented at Research Seminar of the Institute of Education, Olabisi Onabanjo University, Ago-Iwoye, Ogun state.
6. Sanni, K.T, Aransi, W.O & Adebayo,S (2019). Assessment of effectiveness of audio-visual aids on secondary school students' academic performance on Iwo Local Government Area of Osun State, Nigeria. *International Journal of Academic Multidisciplinary Research (IJAMR),*3(9) 21-29
7. Vale, C. (2008). Trends and Factor Concerns Gender and Mathematics in Australia. http/www.fags.org/periodical.Viewed on 15 July, 2016.
8. WAEC,(2020). *West African Examination Council*. May/June Chief Examiner's response retrieve d 12/12/2020
9. Webster's Dictionary of the English Language (1994) Newyork: Gramery Books