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EFFECT OF PROJECTED INSTRUCTIONAL MEDIA ON SENIOR SECONDARY SCHOOL STUDENTS ACHIEVEMENT IN PHYSICS IN ANKPA LOCAL GOVERNMENT AREA, KOGI STATE, NIGERIA

BY

[1]OLONIKAWU, ADE SAMUEL (Ph.D), [2]MOMOH JOSEPH, [3]AMINU, SHERIFDEEN KEHINDE AND [4]OTARU, MARY NENE

[1,2 & 3]Federal University Lokoja
Faculty of Education
Corresponding Author: samuelolonikawu@gmail.com
momohjoseph3@gmail.com,
aminusherifdeenkehinde1996@gmail.com

And

[4]Kogi State College of Education (TECHNICAL),
Mopa, Kogi State
otarumarynene@gmail.com

Abstract

This paper is aimed at finding out the effect of Projected Instructional Media (PIM) on Senior Secondary School Students' achievement in Physics. The study adopted the pre-test post teat non-equivalent control group design and was carried out in Ankpa Local Government Area of Kogi State, Nigeria. A total of 165 SS1 students took part in the study. The instrument for the study was Physics Achievement Test (PAT) with the reliability of 0.70 was administered to collect data for the study. 2 research questions and 2 hypotheses were formulated; the research questions were answered using descriptive statistics while the hypotheses were tested using Analysis of Covariance (ANCOVA). The results showed a significant difference in academic achievement between experimental and control groups in favour of the experimental group. Gender had a significant effect on students' achievement as the female students achieved higher when taught using PIM. It was recommended that Physics teachers should employ the use of PIM in teaching Physics to enhance students' achievement. It was concluded that PIM was more effective in enhancing students' achievement in Physics in SSS.

Keywords: Instructional media, achievements, Physics.

Introduction

Science and technology have always been recognized as critical factors in the process of development. Through its application, the nations' resources have been transformed into goods and services all over the world. Abdul-kadir (2011), observed that the current advancement in science and technology has greatly affected the lives of every human being such that, to be ignorant of the basic knowledge of this development is to live an empty, meaningless and probably unrealistic life. For any nation to attain the status of self-reliance, science must be an important component of that nation irrespective of race, creed or sex (Nsofor, 2001). Science is defined as the systematic body of knowledge obtained by methods or techniques based on observation and experimentation as its authority. It seeks to explain the natural phenomenon using enquiry processes or activities. The branches of science are: physics, chemistry, biology, among others and can be broadly classified into natural and applied sciences (Aigbomian, 2002). Physics is one of the core subjects in Nigerian secondary school curriculum; because of its importance, all science students enroll for it in the Senior Secondary School Certificate Examination (SSCE) (Ahmed, 2008). Physics is introduced to students at senior secondary school level as a preparatory ground for human development, where career abilities are groomed, potentials and talents discovered and energized (Federal Republic of Nigeria, 2009). The quality and quantity of science education received by secondary school students are geared towards developing future scientists, technologists, engineers, and related professionals (Kareem, 2003). The teaching and learning of all science subjects in general and Physics in particular require a lot of instructional media.

Instructional media are channels of communication through which messages; information, ideas and knowledge are conveyed or disseminated to learners (National Teachers' Institute [NTI], 2011). Projected instructional media is used to display moving or still pictures as well as opaque materials by a shining lamp onto the object from above. A variety of materials like book pages, objects, coins, postcards or any other flat materials that are non-transparent are projected and its effectiveness depend on the quality of the projected image. This media could help to reduce the abstract nature of the concepts and enhance students' achievement of physics concepts. Projected instructional media are not available in many schools, where they are available; they are grossly inadequate in supply. The scarcities of instructional media in many schools today have resulted in ineffective teaching of Physics leading to poor achievement of students both in internal and public examinations. Eniayeju (2007) in support of this, reported that factors responsible for students' poor achievement in science, technology and mathematics are, poor laboratory facilities, inability of science teachers to put across ideas clearly to the students and inadequate number of learning facilities in schools as against consistent increase in the number of schools and students' enrolment.

Projected instructional media are those channels of communication which promote the effectiveness of instruction and help the teacher to communicate ideas effectively to his students (Ali, 2012). These media are alternative channels of communication which a Physics teacher can use to concretize a concept during his/her teaching. They include all the substantial resources that an educator might use to implement instruction which facilitate students' achievement of knowledge. They aimed at grasping or stimulating students' attention, sprouting and arousing their interest, supporting their learning with living examples and visual elaboration, which make classroom learning environment enjoyable (Isola, 2010). Physics is very important for national development because it serves as a spring board for many careers in science and technology; and has application nearly in every field of life. The persistent poor achievement of students in physics in Nigeria Senior Secondary School level is a matter of major concern to all educationist and other stakeholders.

Achievement is the measures of accomplishment in a specific field of study (Musa & Agwagah, 2006 & Abakpa, 2011). The researcher maintained that achievement of the students is the demonstration of the abilities to attain certain levels of instructional objectives outcome of their classroom instruction and experience. The utilization of the projected instructional media in teaching and learning of physics is essential; this is because projected instructional media are regarded as reinforce of cognitive, affective and psychomotor aspect of learning (Adikwu, 2013). The teaching learning process may lead to an effective knowledge as students tend to remember what they see, touch, feel and manipulate.

Physics is very important for national development because it serves as a spring board for many careers in science and technology; and has application nearly in every field of life. The persistent poor achievement of students in physics in Nigeria at the Senior Secondary School level is a matter of serious concern to all educationist and other stakeholders. Practically oriented classes are expected to enhance better understanding of the learned concept and thus improve students' academic achievement. The studies on the practical teaching of the concept of waves are rare. The study is undertaken to fill these gaps. The problem of this study therefore is that, will the use of PIM enhance student achievement and retention in Physics? or will the use of PIM close the achievement gap between boys and girls in Physics.

Gagne's Theory of Learning

Gagne (1973) represented the behavioral school of thought (Adler, 1973). As a behavior psychologist, Gagne devoted his time to study conditions of learning. He believes that learning occurs as a result of interaction between the learner and the environment. Learning is known to have taken place when we notice (observe) that the learner's behavior or performance has been modified (altered noticeably).

Gagne maintains that the stages described by Piaget are not necessarily the inevitable result of an inborn "timetable" but are, instead a consequence of children having learned sets of rules and that are progressively more complex. How do children acquire these sets of rules? According to Gagne, children are "taught" the rules by their physical and social environment. Gagne emphasized pre-requisite knowledge in learning Physics, that is, the idea that one cannot master complex concepts without mastering the fundamental concepts necessary for such complex concepts. This study employed the idea of Gagne who emphasized the need for pre-requisite knowledge. It is seen that secondary school Physics, are arranged sequentially from simple definition to methods, types, operation, and down to a more complex aspects of the subject.

Achievement of Students in Physics

According to Wikipedia (2010), achievement means a thing that somebody has done successfully especially using one's own effort and skill. Academic achievement of students is needed to erase the record on poor performance of students in external examinations especially in Physics. Using PIM to teach may improve the learning experience and improve on students' performance. Recent research reports show that achievement in Physics has continued to be low. Salman (2002) stated that students' performance in Senior Secondary Certificates Sciences Examination has remained very low as many of the candidates scored zero or marks within zero range. Ezeamenyi (2001) remarked that WAEC chief examiner's report on Physics portrayed poor performance. Ezeamenyi went further to state that WAEC (2002) in its report wrote, "Very poor; only thirty nine percent of all the students who sat for the WAEC examination in Physics succeeded". Furthermore, WAEC (2002) observed that students still performed poorly in Physics. These poor achievements of students in Physics have been blamed on the teaching strategy. High achievement of students is needed in every subject. Defining academic achievement, it means when one has the ability to attain success in one's studies; when one receives great grades (Ezeamenyi, 2001). Interest is one of the factors that promote high achievement of students in Physics (Onah & Agwagah, 2004). It is the feeling that one has when he/she wants to know or learn about something. Sometimes, high interest implies high achievement, but it may not be so always. Although high interest does not always imply high achievement, it is generally noticed that when a student is interested in a particular concept, he is more ready to learn about it. The level of interest also determines the level of attention which is also important in the course of the lesson. When the teacher succeeds in raising the attention level to be very high, learning becomes easy on the part of the students irrespective of their sexes.

Concept of Conventional/ Chalkboard method of teaching

Conventional method of teaching alias Chalkboard method is a situation whereby the teacher is the only custodian of what is being taught. The teacher writes and

cleans the board while teaching is going on. The teacher using this method redraws or rewrites what he/she had written and cleaned earlier to enable students learn. This he/she does when students ask questions on previous concepts that had been erased on the chalkboard. Writing and cleaning the chalkboard is a common feature of this Conventional method which is also a disadvantage. The control groups were taught Waves using this method of teaching and the outcome of such method of teaching was found on students' achievement using Waves Achievement Test (WAT) for both pre-test and post-test.

Studies on Science, Technology, Mathematics and other related areas

Science related courses are needed by everyone in the society. Oloyede (2010) worked on *Science, Technology, Engineering and Mathematics Education (STEM) for women empowerment as a solution to Global Economic Crisis*, and discovered that Nigerian women do not have much access to Science, Technology, Engineering and Mathematics (STEM) Education. Oloyede (2010) also pointed out that majority of the educated women are found in the art/social sciences and the humanities. Teaching Physics concepts using PIM package may encourage female students to be interested in pursuing science related courses with their male counterparts.Ikokwu and Akaeze (2010) researched on the impact of Global Economic Crisis (GEC) on Nigerians, Science, Technology, Engineering and Mathematics (STEM) Education as a panacea: a survey of Onitsha business community. It was a survey design which was guided by research questions and hypothesis. After the research, the result of the study revealed that the crisis has lots of impacts on the lives of the citizens. They resorted to some life copying skills but still believed that STEM education can inculcate skills and competences needed to overcome the crisis (as it affects Nigeria) in the nearest future. This study may equally inculcate skills and competences needed to produce software packages, present created packages and enable learning to take place while watching the computer – screen.

Studies on Gender as a Factor in Students' Achievement in Mathematics

Gender issues in students' achievements are inconclusive from research findings. Meremikwu (2002) carried out a research study on gender differences and Mathematics achievements among secondary students in Southern Cross River state. Analysis of variance and t-test were used in analyzing the data. Meremikwu found among other things that the Mathematics achievement of girls in single sex school was significantly better than their male counterparts in the single sex schools. Single sex schools should therefore be encouraged to maintain gender balance in Science, Technology and Mathematics.

Researches showing gender as having no significant effect on students' ability in understanding of science and mathematical concepts include the following: Etukudo (2002) in ABACUS; Ahiokwu (2002) who worked on social implications of science in Rivers State found out that when boys and girls are compared, their

attitudes to the social implications were similar and neutral. Olagungu (2001) carried out a study on sex, age and performance of boys and girls and found out that gender has no significant effects on students' performance in Mathematics.

Gender Issues in Physics Achievement of students

Another factor affecting Achievement of students in Physics is Gender. Some female students view the subject-Physics as belonging to men. Oloyede (2010) viewed this situation as a problem. Poor performance of students in Physics, especially female students, is a problem that needs immediate attention Oloyede (2010) confirms this statement when he stated that "Education is the prime avenue for elevating women's status, yet throughout the third world countries, a lower percentage of women than men are literate". This observation on the third world countries including Nigeria is a worry to educators in the field. It is necessary to find a way of moving both male and female students forward as early as possible so that when they grow up to adulthood, the percentage of educated women will not be low when compared to their male counterparts.

Studies on the use of electronic-learning/Multimedia Projection in teaching science subjects

Viewing the screen while teaching is going on is called for in this technological world. Emesini (2011) worked on electronic-learning as a new method of studying Geography in Universities in Nigeria as perceived by lecturers and students. The researcher used descriptive survey design. The population of 1241 was used – 61 lecturers and 1180 students. The entire population of lecturers was used while proportionate random sampling technique was used to draw 305 students. After data collection, mean and standard deviation were used in analyzing the data. The findings revealed that e-learning would make teaching and learning of Geography easier. Based on the findings, it was recommended that institutions of higher learning and secondary schools should set up implementation committees for the smooth take off of e-learning in our institutions. Since e-learning was effective in Geography, it may equally be effective in Physics- especially its branch called Waves. PIM may be an effective package also.

Purpose of the Study

The main purpose of this study is to investigate effect of projected instructional media on senior secondary school students' achievement in physics in Ankpa Local Government Area, Kogi State, Nigeria.

The study therefore:

1. Determine the mean difference in achievement scores of students taught physics (waves) using PIM and their counterpart taught without PIM in Ankpa LGA of Kogi State.
2. Determine the mean difference in the mean achievement scores of male and female students taught physics (waves) using PIM and those taught without PIM in Ankpa LGA of Kogi State.

Research Question

The following research questions were raised to guide the study:

1. What is the mean difference in achievement scores of students taught physics (waves) using PIM and their counterpart taught without PIM?
2. What is the mean difference in the mean achievement scores of male and female students taught physics (waves) using PIM and those taught without PIM?

Research Hypothesis

Two hypotheses were formulated and tested at 0.05 level of significance:

Ho1. There is no significant difference in the mean achievement scores of students taught Physics (waves) with PIM and those taught without the use of PIM.

Ho2. There is no significant difference in the mean achievement scores of male and female students taught Physics (waves) using PIM.

Methodology

This study adopts the quasi experimental research design. Specifically, the pre-test post-test non-equivalent control group design was used.

The population for the study is all senior secondary school I students (SSS I) who offer physics as a subject in the study area. The study was conducted in Ankpa LGA of Kogi State.

A simple random sampling technique was used to select ten schools from all the secondary schools that offer physics in Ankpa local government areas of Kogi State. 165 students were selected for the study from the ten secondary schools sampled in Ankpa LGA, of Kogi State. The schools chosen were randomly assigned to experimental and control group (1 school each for experimental and control groups) in each of the schools selected, intact class was used. The instrument for data collection is a Physics Achievement Test. The instrument is a 20 item multiple choice objective questions with options A – D. Each correct answer attracted five marks while each wrong answer attracted a zero score.The reliability of the instrument was tested at 0.70 using the split-half method of Pearson r. The instrument was validated by three experts, one from Test and Measurement in the Department of Educational Foundation and General Studies and two from the Department of Science Education all in University of Agriculture, Makurdi, Benue State. In order to account for initial differences among the groups, pre-test was administered to the two groups; the results obtained were used as covariate in the final analysis. Also, to control the teacher variable, both groups were +taught by research assistants who were the Physics teachers in the selected schools. The research assistants were properly trained on the use of projected instructional media. The experimental group was taught the process of Waves using the projected instructional media while the control group was taught without the projected instructional media. After the completion of the teaching, post-test was

administered to both groups. Two weeks later, the retention test was administered to both groups.

Results

Table 1

Mean Achievement Scores and Standard Deviation of Students in Experimental and Control Groups

Groups	N	Pretest mean	SD	Posttest (BAT) mean	SD	Mean gain
Experimental	87	22.83	14.57	71.29	13.88	48.46
Control	78	25.22	17.95	36.26	15.68	11.04
Mean Difference						-2.39
Total	165	35.03		37.42		

Table 1 shows that in pretest, the experimental group had a mean achievement score of 22.83 with a standard deviation of 14.57, while the control group had a mean achievement score of 25.22 with a standard deviation of 17.95. The Table also shows that in the post-test, the experimental group had a mean achievement score of 71.29 with a standard deviation of 13.88, while the control group had a mean achievement score of 36.26 with a standard deviation of 15.68. the mean value of pre-test of the control and experimental group was 25.22. This implies that the students had a similar entry behaviours before the commencement of the study. After the study was carried out, the experimental group had alpha mean of 71.2 in the post-test while the control group had a mean of 36.26 in the post-test. The mean gain of the experimental group was 48.4 while that of the control group was 11.04. this implies that the students in the experimental group achieved higher in Physics than the students in the control group.

Table 2

Mean Achievement Scores and Standard Deviation of Male and Female Students in Experimental Group

Gender	N	Pretest mean	SD	Posttest SD	(BAT) mean	Mean gain
Male	57	19.09	12.83	72.63	13.47	53.54
Female	30	27.24	15.39	69.71	14.36	42.47
Mean Difference			-8.15	2.92	11.07	
Total	87					

Table 2 shows that in pre-test, males had a mean achievement score of 19.09 with a standard deviation of 12.83, while the females had a mean achievement score of 27.24 with a standard deviation of 15.39. In post-test however, males had a mean achievement score of 72.63 with a standard deviation of 13.47, while the females had a mean achievement score of 69.71 with a standard deviation of 14.36. The mean difference between the achievement scores of male and female students in pre-test was 8.24 while a mean difference of 2.92 was recorded between the male and female students in the posttest. The overall mean difference between the mean achievement scores of male and female students in experimental group with regard to pre-test and post-test scores was 11.07.The implication of this difference is that the male students performed better than their female counterpart that used PIM.

Table 3

Summary of Analysis of Covariance (ANCOVA) of Experimental and Control Groups' Achievement Scores in BAT

Source of variance	Sum of squares	df	Mean square	F	Sig
Corrected Model	50698.51	4	12674.63	57.48	.00
Intercept	131533.15	1	131533.15	596.49	.00
Pretest	41.99	1	41.99	.19	.66
Group	48333.66	1	48333.66	219.19	.00
Error	35281.75	160	220.51		
Total	580189.42	165			
Corrected Total	85980.26	164			

From table 3, the significance value against group is 0.00. Hence, P=0.00 < 0.05, the null hypothesis is rejected. It therefore means that, there is a significant difference in the mean achievement scores of students taught Physics in the experimental and control groups. This implies that, students taught with projected instructional media achieve higher than those taught using conventional method.

Table 4

Summary of Analysis of Covariance (ANCOVA) of Male and Female Students' Achievement Scores in BAT

Source of variance	Sum of squares	df	Mean square	F	Sig
Corrected Model	50698.51	4	12674.63	57.48	.00
Intercept	131533.15	1	131533.15	596.49	.00
Pretest	41.99	1	41.99	.19	.00
Gender	17.30	1	17.30	.08	.78
Error	35281.75	160	220.51		
Total	580189.42	165			
Corrected Total	85980.26	164			

The summary of the ANCOVA presented in Table 4 shows that the treatment (projected /media) was not significant due to gender in the achievement test. This is shown by the gender values (F=.08, P=.78; P>0.05) as presented in Table 2. Hence, the null hypothesis was not rejected. This means that there is no significant difference of projected instructional media on the Senior Secondary School achievement scores of male and female students' in physics.

Though from the research question, there was a bridge of gap between the achievement scores of males and females but the effect was not statistically significant.

Discussion of Findings

The findings of this study showed that students taught with PIM achieved significantly better than the students taught without using PIM. The significant difference could be as a result of the ability of the PIM to provide both aural and visual representations of experimental procedures. This could also be due to the fact that PIM has the potential of making students learn more because fun and entertainment are natural ways through which students learn, therefore, improving

the achievement of students. The above findings are in line with the previous researchers like Awolaju (2015), Abdu-Raheem (2012), Musa & Agwagah (2006), Abakpa (2011) who indicated that students achieved significantly better when taught with projected instructional media than without projected instructional media. Musa and Agwagah reported in their study that, the achievement of students in physics greatly improved with the innovative use of projected instructional media and creation of sound strategies for disseminating science in the classroom.

This study indicates that female students taught using projected instructional media, achieved significantly higher scores than male students in their achievement though the difference was reduced after treatment and there was no statistical significant difference in their achievement scores. Generally, male students do better than female students at all levels. This could be due to the fact that some female students believe that science is too difficult and not important for their future. Also, the males are already inclined to science subjects and see it as a necessity, therefore pay serious attention to lessons. The results from this study showed that gender had significant influence on students' achievement in physics. For knowledge to develop, the acquired materials in mind need to be preserved in form of images. Therefore, projected media is combined with still and motion pictures which captured the students mind and helped them to achieve better. The male probably achieved better than the females because they are more inclined to science related subjects and have a natural positive attitude to science subjects while the females show negative attitude.

The result of this study supports the view of previous researchers like Abdu-Raheem (2012) and Ariyo (2014), who observed that gender, had significant effect on achievement in favour of males. For instance, Abdu-Raheem (2012) in the study of the influence of gender on Secondary Students' Academic Achievement in South-West, Nigeria, reported that male and female students achieved equally in English Language while males achieved better than females in science. He therefore, recommended that necessary materials/equipments should be provided to make sciences interesting to girls. Nevertheless, the findings of this study are in disagreement with Peter (2014) and Sunday (2014) who found no significant difference in academic achievement and retention of male and female students. The study revealed higher mean achievement scores for female students who were taught using PIM and lower means achievement scores for male students who were taught using PIM. This shows that there is a significant interaction effect of projected instructional media and genders on students' mean retention scores in biology. The female students achieved better than the male when taught with PIM. The researchers observed that the female students were excited about the projected instructional media and this excitement was enduring. Also, the female students showed greater zeal in trying to understand the topic taught by asking questions related to the topic. This could be the reason why they performed better.

Conclusion

Based on the results of this study, the following conclusions were made.
The use of PIM enhanced students' achievement more than the chalkboard method. Physics teachers should be innovative by considering PIM for use as it enhances the achievement of both male and female students in Experimental group. Students taught Physics using the PIM performed higher than their counterparts taught the same Wave using the chalkboard method. There was a significant difference in gender on achievement of students in Wave. Although both scored highly in achievement, there was significant interaction effect in the students' interest in Wave. The achievements of both male and female students were enhanced as a result of the use of the PIM. The interaction effect was not significant in terms of achievement.

Recommendations

The following recommendations were made:
1. Since the use of projected instructional media in teaching has been found to enhance achievement and retention in physics, physics teachers should employ it more in the teaching of the subject especially for topics that are abstract.
2. Teachers of Physics should be encouraged to use the PIM for better performance by both male and female students.

References

Abakpa, B. O. (2011). *Effect of mastery learning approach on senior secondary school students' achievement in geometry.* Unpublished Ph.D. Thesis University of Agriculture, Makurdi.

Abdul-kadir, A. A. (2011). (Youths interest in business and technical skill acquisition. It's implication for national development. *Journal of Science Technology and Mathematics Education,* 7(3): 238 – 244.

Abdu-Raheem, B. O. (2012). The influence of gender on secondary school students' academic performance in south-west, Nigeria. *Journal of Social Science,* 31(1):93-98.

Aigbomian, D. O. (2002). *Science for all: Implications for teacher and national development*. Inaugural lecturer in Ambrose Ali University, Ekpoma 27th June, Ambik Press.

Akoja, I.E & Ali, F.A. (2012). The impart of instructional materials on the academic performance of primary school pupils in Makurdi LGA of Benue State. In P.A. Eniayeju and P.T. Ortese (Eds). *Contemporary issues in education*. Makurdi: Destiny Ventures.

Ali, A. O. (2012). Gender difference and school location factors as correlate of secondary school student achievement in Physics, Hawail: USA. *The 2011 Mani International Academic Conference*, 259 – 265.

Ariyo, A. O. (2011). Gender differences and school factors as correlate of secondary schools' achievement in physics. *The 2011 Makes International Academic Conference.* Mawi, Hawail, USA. 259 – 263.

Atovigba, M. V. (2012). Gender Trends in Nigerian Secondary School Students' Performance in Algebra. *Research Journal of Mathematics and Statistics* 4(2): 42-44.

Awolaju, B. A. (2015). Instructional materials as correlates of students' academic performance in biology in senior secondary schools in Osun State. *International Journal of Information and Education Technology*, 6(9), September 2016.

Ayodele, M. O. (2009). Gender Differences in Mathematics and Integrated Science Achievement among Junior Secondary School Students. *MJLI*. 6:41-53.

Eniayeju, P. A. (2007). Maintaining Gender Friendly and Gender Sensitivity in Science Classroom for Enhanced Performance. *Keynote address presented during the National Workshop of the Gender and STM Education Panel of STAN*, held at Abuja, from 5 – 9th June, 2007.

Federal Republic of Nigeria (2009). *National Policy on Education*, Abuja: NERDC Press.

Isola, O. M. (2010). *Effects of Standardized and Improvised Instructional Materials on Students' Academic Achievements in Secondary School Physics*. M.Ed Thesis, University of Ibadan, Ibadan.

Kareem, L. O. (2003). *Effects of Audio-graphic self-instructional package on senior secondary school students' performance in biology in Ilorin*, Nigeria. Unpublished Ph.D. thesis, Faculty of Education, University of Ilorin, Ilorin.

Musa, D.C. & Agwagah, U.N.V. (2006). Effect of incorporating practical into Mathematical evaluation on senior secondary school students' achievement in Mathematics. Abacus: *Journal of Mathematical Association of Nigeria*, 3(1), 55 – 56.

National Teachers' Institute (2011). *The Concept and Philosophy of Integrated Science,* Kaduna: NTI publication.

Nsofor, C. C. (2001). Cultural impediments on women in science, technology and mathematics education. *42nd Annual Conference Proceedings of STAN* Ilorin.

Oludipe, D. I. (2012). Gender difference in Nigeria Junior Secondary Students' Academic and Achievement in Basic Science. *Journal of Educational and Social Research* 2(1):18-23.

Peter, O. D. (2014). Effect of gender on students' academic achievement in secondary school social studies. *Journal of education and practice* www.iiste.org 5(2):10-14.

Sunday, B. A. (2014). Effect of gender on secondary school students' achievement in map work. *European Journal of Educational Studies*, *6*(1):25-30.