

The Effectiveness of Spreadsheets Implementation and Cooperative Learning on Students' Conceptual Understanding About Electricity and Magnetism in Senior Secondary Schools in Makurdi Local Government Area of Benue State.

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Abstract: *This study investigated the effectiveness of spreadsheets implementation and cooperative learning on students' conceptual understanding about electricity and magnetism in secondary senior school in Makurdi Local Government Area of Benue State. Four objectives were set for the study which are to examine the factors that affect the spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area, determine the effective use of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area, examine the importance of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area, examine the gender effect of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area. The study adopted quasi experimental research design with a population of 1050 and sampling size of 289. Total enumeration sampling technique was adopted considering the population using taro Yamane formula, the data collected were analysed using descriptive statistics of frequency table, mean and standard deviation scores while correlation analysis was used for the hypotheses. The result shows that the, spreadsheets implementation and self methods affect students' performance in Physics. It also revealed that there is a significant difference in students' performance in Physics between students taught using the spreadsheets implementation teaching method and those taught using the cooperative learning method. Those taught with spreadsheets implementation teaching method performed better than those taught with cooperative learning method. The findings also showed that there is no difference in students' performance in Physics between male and female students taught with the spreadsheets implementation teaching method. This implies that male and female students' performance in Physics is not different when taught with spreadsheets implementation teaching method. The findings also showed that there is no difference between male and female students' performance in Physics taught with cooperative learning method. Furthermore, the result revealed that there is a difference in students' performance in Physics between students in Female schools and those in Male schools taught with spreadsheets implementation teaching method. Students in Male areas performed better than those in the Female area taught with spreadsheets implementation teaching method. In the same vein, the findings showed that there is a difference between Male and Female students' performance in Physics taught with self method of teaching students in the Male areas performing better than those in Female areas. The study recommended that, Spreadsheets implementation teaching method should be practiced intensively by Physics teachers since the method has been proved effective in enhancing students' academic performance, Physics teachers should reduce the use of self method in teaching Physics to enhance students' academic performance, Physics teachers should make the teaching-learning of Physics an interactive and activity-based for the students using spreadsheets implementation method, Government at all levels should periodically conduct regular workshops for teachers on the effective use of spreadsheets implementation teaching method, Government should also encourage Physics teachers to use spreadsheets implementation method by providing the needed conducive environment for teaching and learning with adequate instructional materials.*

Keywords: *Effectiveness, Spreadsheets, Implementation, Cooperative Learning, Students, Conceptual, Electricity, Magnetism, Teachers, Physics, Senior Secondary Schools.*

1. INTRODUCTION

Education and science are regarded as the key driver of a nation's progress, regeneration, and future prosperity, especially in areas of the labor market, innovation, trade and human capital development (United Nations Educational, Scientific and Cultural Organization (UNESCO, 2017). This implies that the key to building the economy and future prosperity of any country is producing professionally qualified candidates suitable for the country's workforce through quality science education (National Planning

Commission, 2013). One of the fundamental purposes of science education in the 21st century is preparing learners to acquire and apply the scientific knowledge and skills required to thrive in today's world. Sciences provide useful preparation for learners who plan to take up science-oriented careers and it introduces basic physics concepts such as electricity, magnetism, motion, force and energy. Physics has played a fundamental role in the development of almost all other disciplines in science and every kind of technology makes use of the scientific principles linked with physics. Despite the importance of physics, studies have revealed that there are factors affecting the performance and enrolment of learners in physics (Slisko 2012). For instance, the American Association of Physics Teachers (AAPT, 2013) indicates that learners' performance and enrolment in physics have been reflecting a decline over many years probably due to the abstract nature of the subject. Marusic and Slisko (2012) claim that learners consider the subject to be too mathematically oriented, too extensive and mostly dependent on textbooks.

Research indicates that most learners do not enrol for physics at the university level because very few learners offer physics at the secondary school and the best of them end up enrolling for courses like medicine, engineering and other lucrative courses at the tertiary institution. This makes it difficult to find skilful university graduates to become physics teachers (Mbamara & Eya, 2015). According to Masood (2014), the decrease in physics performance and enrolment is one of the biggest challenges for physics in the 21st century since most learners lack motivation. Research claims that the poor performance and low enrolment of physics in the United State can be attributed to the social and cultural basis of the nation, where most of the learners perceive physics as a difficult subject that requires extra time and hard work in understanding the subject (Masood, 2014). Osborne, Simon, and Collins (2003) explain that the poor performance and low enrolment of learners in physics oriented courses could be attributed to the negative attitude learners develop towards physics. There are several historical, systematic, social, school, political, environmental and individual factors that have contributed in a complex way to the downward trend of learners' enrolment and poor performance in physics (Thompson, Lubben & Bennett, 2011). One of the identified factors contributing to this trend is related to physics teachers' professionalism in terms of knowledge, skills, attitudes, beliefs and classroom practice (Blömeke & Delaney, 2012). It is possible that most teachers still use the one-way traditional teaching method as a classroom practice in teaching physics. In fact, the AAPT (2013) claim that the traditional one way lecturing approach of teaching high school physics is ineffective since it does not support learners to comprehensively and correctly understand basic scientific concepts. Learners could develop inadequate understanding from such teaching practice, which may later develop into misconceptions and may to some extent affect their performance in the subject.

Learners' performance in terms of results depends on many factors within and outside the school. Most important is the teacher-related factor. According to Mudasir and Ganai (2017), there is an asserted saying that "No educational organization can develop above the standard of its teachers". This implies that without a knowledgeable, strongly inspired and proficient teacher, the link to educational accomplishment in learners' academic performance will gradually collapse. The 2001 No Child Left Behind (NCLB) act in the United States indicates that proper preparation of teachers should include teachers' ability to understand the knowledge of teaching and learning, being knowledgeable about the subject matter, having prior experience and the necessary set of qualifications as required by the teaching governing body, and having these indicators as some of the requirements that determines teachers' effectiveness (US DoE NCLB Act, 2001). According to a survey carried out on measures of effective teaching in the United States by the Bill and Melinda Gates Foundation, report indicate that effective teachers are the principal factor contributing to learners' success and they are therefore termed as the keystone of quality in any education system (Kane, Kerr & Pianta, 2014). Since physics education is a major factor in enhancing the drastic technological revolution required to meet the needs of any country, the skills provided in the 21st century education must be aligned with this technological transformation. This requires the teaching and learning of physics to be characterized by an interactive and experimental practice, where learners are active in studying new knowledge under the guidance of a teacher. However, research indicates that teachers encounter a variety of problems which are unique to the teaching of physics (Tefaye & White, 2012). This implies that teachers need to engage in professional development that will enhance their teaching strategies. The development of new teaching strategies helps to promote active learning in physics rather than using the traditional method of teaching which has made the learning of physics passive (Maftei & Popescu, 2012).

Research Questions

The following were raised to guide the study

1. examine the factors that affect the spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area
2. determine the effective use of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area
3. examine the importance of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area
4. examine the gender effect of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area

Research Hypothesis

HO₁: There are no significant difference in the factors that affect the spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area

HO₂: There is no significant difference in the effective use of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area

HO₃: There is no significant difference in the importance of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area

HO₄: There are no significant difference in the gender effect of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area.

2. METHODOLOGY

Research Design

The research design that will be employed is quasi experimental design of pretest-posttest group. The justification for employing quasi experimental design is because; it is not possible for the researcher to meet all the conditions of a true experiment design. Hence, intact classes will be randomly assign to experimental and control groups. Intact classes are randomly assigned to avoid disrupting the school activities. Both the experimental and control groups is given the same pre-test before treatment and post-test after the treatment as well as the retention test after two weeks of treatment.

Area of Study

Makurdi Local Government Area of Benue State is the study area. The local government was established in 1927. It became headquarter of Benue State province in 1976. It is located at the latitude of 7.73° North and longitude of 8.54° . Makurdi local government area is bounded by Guma local government in the North, south by Gwer-East local Government Area, in the East by Tarkaa local Government area and in the West by Gwer-West local government area. It has eleven council wards which include; Agan, Ankpa/wadata, bar, central/south mission, clerk/market, Fildi, Mbalagh, Morden market, North bank I, North bank II and Wailomayo council wards. The area is predominantly an agricultural catchment area specializing in cash crops, subsistence crops and variety of potentials. The major ethnic groups in Makurdi are the Tiv, Idoma and Igede. Other minor ones are Jukun and Hausa. There are also economically significant numbers of non-indigenous ethnic groups in the state such as Igbo, Yoruba and Igala who are mostly traders. The indigenes are mostly farmers and civil servants. The tertiary institutions in Makurdi include; Joseph Sarwuan Tarkaa University (Federal University), Benue State University (State University), National Open University of Nigeria, Akawe Torkula Polytechnic, the Schools of Nursing and Midwifery. Makurdi also have many secondary and primary schools including government, private and missionary schools.

Population of the Study

A population study is a study of a group individuals or elements, taken from a general The population of a study will consist of 1050 Senior Secondary School SS3 physics students in 20 government grant aided schools in Makurdi Local Government Area of Benue State (Benue State Ministry of Education, 2018). The government grant aided schools are preferred because their establishment and operation is based on the state Ministry of Education operational mandate and guidelines.

Sample and Sampling Technique

A study sample size of 290 senior secondary schools students in 20 government grant aided schools in Makurdi Local Government Area of Benue State (Benue State Ministry of Education, 2018). The government grant aided schools are preferred because their establishment and operation is based on the state Ministry of Education operational mandate and guidelines.

Sampling techniques are procedures adopted to systematically select the chosen sample in a specified away under controls, (Nwana, 2005).

In this study, the researcher adopted the convenient sampling method to determine the sample size. 1050 senior secondary schools students in 20 government grant aided schools in Makurdi Local Government Area of Benue State, the researcher conveniently selected two hundred and ninety (290) respondents as sample size for this study.

Instrument for data collection

The instrument to be used for the study is “The Effectiveness of Spreadsheets Implementation and Cooperative Learning (SICL)” on students’ concept understanding about electricity and magnetism in secondary senior school in Makurdi Local Government Area of Benue State

Test (ESICL) to establish the group equivalence of the experimental and control groups. This enables the researcher to ascertain the comparative effect on performance and retention using Physics when teaching SSII students magnetism and wave.

Physics Spreadsheets Implementation and Cooperative Learning Test (P SICL T)

The Test (SICL) is made up of 40 items multiple choice objective test questions with four options per question. These are based on secondary school new curriculum developed by Nigeria Educational Research and Development Centre (NERDC) for senior secondary schools. The test items developed is based on the following topics; student’s magnetism and wave. The topics are taken from essential Physics text book and Physics passed questions for secondary schools. The (SICL) contains two sections namely: section A and B. section “A” contains the demographic information of respondents while section “B” contains 40 multiple choice items. Each of the items has options A-D from which respondents is expected to choose the correct option. The correct answer will be giving by ticking the letter bearing the correct answer to the question. Each question carries two marks.

Validity of Instrument

The (SICL) Test was validated by three experts, one in Measurement and Evaluation Joseph Sarwuan Tarka University Makurdi, one in the Department of Science Education Joseph Sarwuan Tarka University Makurdi and another one from public School. The experts are requested to critically examine the SICL and BRT and advised the researcher on the scope, content, relevance suitability and appropriateness of the instrument in accomplishing the objective of the study. The experts assess the language of the instrument. The experts also checked the lesson plans and the marking schemes whether the answers to SICL are correct or not. The experts made corrections and suggestions.

Reliability of Instrument

A trial-testing of (SICL) was conducted using Physics student’s of Golden College North Bank Makurdi, Benue State. Forty copies of the instruments were distributed to thirty students (Appendix K. pg.55). The reliability coefficient of the instrument (SICL) was found to be 0.809 using Kuder-Richardson formula ($K-R_{20}$). A co-efficient value of 0.809 indicated that the research instrument was relatively reliable. The range of a reasonable reliability is between 0.67 and 0.87, (Taber, 2017). The justification for using Kuder-Richardson formula ($K-R_{20}$) is because the items are scored dichotomous. That is, two points for each correct answer and zero for incorrect answer Emaikwu (2011).

Method of data collection

The method of data collection was face to face administration of (SICL) by the research assistants. The researcher develop a training annual (Appendix J) that was used to train the SSIII Physics teachers from each of the schools that will be selected which will served as research assistants. The research assistants will administer the Test (SICL) before treatment (pre-test), give the treatment and administer the Test (SICL).

Experimental Procedure: Physics lesson plan on human skeleton and cell will be taught during the treatment to experiment group (Appendix D,) while traditional class room and lesson plans on human skeleton and cell will be taught during the treatment to the control group by researcher and research assistants. The treatment commence with administering pre-test (SICL) follow by lessons on human skeleton and cell. Each lesson will last for 40minutes with three periods per week both on experimental and control group. Two lessons notes, one for experimental group and another one for control group. The treatment will last for six (6) weeks, week1 for familiarization and administration of pre-test, week2-4 treatments, week5 administration of post-test, week6 making and coding of post-test scores. After two weeks of treatment and post-test Physics was administer.

Control of Extraneous Variables: The following extraneous variables that will result to research subjectivity were taken care of thus:

Hawthorne effect: This occurs when the subjects for the experiment are aware that they are being used for an experiment. In order to eliminate this effect, the students regular Physics teachers of the schools was train and used for both the experimental and control groups. This will help to reduce students’ suspicion that would have been arising if the researcher was involved in the treatment (teaching).

Teacher qualification variables: variability that might arise due to teacher qualification will be eliminated by research assistants who will be trained before the commencement of the study.

Method of data analysis

Descriptive statistics of Means of Standard Deviation will be used for answering all the research questions while inferential statistics of Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. The decision rules any value less than 0.05 is accepted otherwise reject. ANCOVA is use when there is need to control for an additional variable which may be influencing the relationship between the independent and dependent variables and by doing this, the researcher removes the bias or likelihood that the intact groups not homogenous or equivalent Emaikwu (2019).

3. RESULT AND DISCUSSION

3.1. Results

The result of the data analyses and interpretations are presented according to the research questions asked.

Research Question 1: What are the factors that affect the implementation and cooperative learning on students’ conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area?

Table 1 showed the mean and standard deviation of students under spreadsheets implementation and cooperative learning methods. The spreadsheets implementation method has a mean of 27.1 and standard deviation of 10.12 while cooperative learning method has a mean of 25.8 and standard deviation of 11.15. Both groups had low mean and high standard deviation. This implies that before the treatment, there was low performance by the students. The standard deviations showed a heterogeneous performance by the students.

Teaching Method	N	Mean	SD
Factors affecting Spreadsheets	145	27.1	10.12
Cooperative learning	145	25.8	11.15

Research Question 2: What are the effective use of spreadsheets implementation and cooperative learning on students’ conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area?

Table 2 above showed that the mean and standard deviation of those taught with spreadsheets implementation method are 33.46 and 11.13 while those of taught with cooperative learning method are 36.08 and 12.48 respectively. Comparatively, a mean difference of 1.35 indicated that there is a difference in students’ performance in Physics between students taught with spreadsheets implementation method and with cooperative learning method.

Teaching Method	N	Mean	SD
Use of Spreadsheets implementation	145	33.46	11.13
Cooperative learning	145	36.08	12.48

Research Question 3: What are the importance of spreadsheets implementation and cooperative learning on students’ conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area?

Table 3 showed that the mean and standard deviation of students in Spreadsheets implementation taught with self method of teaching are 51.65 and 15.75 while students in Cooperative learning method with Cooperative learning of teaching are 49.00 and 16.27 respectively. Comparatively, a mean difference of 15.65 indicated that there is a difference between students in Cooperative learning and students in Spreadsheets implementation, when taught with Cooperative learning method of teaching.

Teaching Method	N	Mean	SD
Spreadsheets implementation	145	51.65	15.74
Cooperative learning	145	49.00	16.27

Research question 4: What are the gender effect of spreadsheets implementation and cooperative learning on students’ conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area?

Table 4 above showed that the mean and standard deviation of male taught with spreadsheets implementation method are 73.33 and 13.85 while female taught with spreadsheets implementation method are 72.82 and 12.27 respectively. Comparatively, a mean difference of 13.85 indicated that there is no difference in students' performance in Physics between male and female students taught with the spreadsheets implementation teaching method.

Teaching Method	N	Mean	SD
Male	145	73.33	13.85
Female	145	72.8	12.27

3.2. Test of Hypothesis

H₀: There are no significant difference in the factors that affect the spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area

Table 5 showed the t-test analysis of students' mean performance test score in Physics between students taught using the spreadsheets implementation teaching method and those taught using the cooperative learning method. Result showed that the t-calculated value of 26.90 was greater than the t-critical value of 1.96 at a degree of freedom of 318. Since the t-calculated value is greater than t-critical value at 0.05 level of significance, the null hypothesis therefore was rejected. Hence, there is a significant difference in students' mean performance test score in Physics between students taught using the spreadsheets implementation teaching method and those taught using the cooperative learning method.

Groups	N	Mean	SD	Df	t-cal.	t-crit.	Decision
Experimental Group (Spreadsheets implementation Method)	290	73.46	11.13	288	26.90	1.96	Rejected
Control Group (Cooperative learning Method)	160	46.08	6.48				

H₁: There is no significant difference in the effective use of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area.

Table 6 showed the t-test analysis male and female students' mean performance test score in Physics taught with self method of teaching. Result showed that the t-calculated value of 2.87 was less than the t-critical value of 1.96 with a degree of freedom of 158. Since the t-calculated value is less than t-critical value at 0.05 level of significance, the null hypothesis therefore was accepted. Hence, there is no significant difference in mean performance test score in Physics taught with self method of teaching.

Groups	N	Mean	SD	Df	t-cal.	t-crit.	Decision
Experimental Group (Spreadsheets implementation Method)	290	47.57	7.04	288	2.87	1.96	Accepted
Control Group (Cooperative learning Method)	83	44.69	5.60				

H₂: There is no significant difference in the importance of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area

Table 7 showed the t-test analysis students' mean performance test score in Physics between male and female students taught with the spreadsheets implementation teaching method. Result showed that the t-calculated value of 0.28 was less than the t-critical value of 1.96 with a degree of freedom of 158. Since the t-calculated value is less than t-critical value at 0.05 level of significance, the null hypothesis therefore was accepted. Hence, there is no significant difference in students' mean performance test score for those taught with the spreadsheets implementation teaching method.

Groups	N	Mean	SD	Df	t-cal.	t-crit.	Decision
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Experimental Group (Spreadsheets implementation Method)	290	73.33	12.85	288	0.28	1.96	Accepted
Control Group (Cooperative learning Method)	145	72.8	9.27				

H₃: There are no significant difference in the gender effect of spreadsheets implementation and cooperative learning on students' conceptual understanding of electricity and magnetism in senior school in Makurdi Local Government Area.

Table 8 showed the t-test analysis students' mean performance test score in Physics between students in Female schools and those in Male schools taught with spreadsheets implementation teaching method. Result showed that the t-calculated value of 10.25 was greater than 54 the t-critical value of 1.96 with a degree of freedom of 158. Since the exact probability value is greater than the significant level of 0.05, the null hypothesis therefore was rejected. Hence, there is a significant difference in students' mean performance test score in Physics between students in Female schools and those in Male schools taught with spreadsheets implementation teaching method. Hypothesis 4 (HO4) There is no significant difference between Male and Female students' mean performance test score in Physics taught with self method of teaching. Table 16: t-test Comparison of Performance Scores of Students in Male and Female Schools taught with cooperative learning Method.

Groups	N	Mean	SD	Df	t-cal.	t-crit.	Decision
Experimental Group Male	145	74.17	12.46	158	10.25	1.96	Rejected
Control Group Female	145	53.34	12.99				

4. Discussion of findings

The findings on research question one shows the difference in students' performance in Physics between students taught using the guide discovery teaching method and those taught with the cooperative learning method, revealed that there is a difference in students' performance in Physics between students taught using the guide discovery teaching method and those taught with the cooperative learning method. Furthermore, hypothesis 1 tested also showed that there is a significant difference in students' mean performance test score in Physics between students taught using the spreadsheets implementation teaching method and those taught using the cooperative learning method. In other words, those taught with spreadsheets implementation teaching method performed better than those taught with cooperative learning method. This is in consonance with a research carried out by Salihu (2015) on the effects of spreadsheets implementation approach on students' academic performance in ecology in senior secondary schools in Sokoto State, Nigeria. The result of the study stated that students in experimental group (i.e. students taught using spreadsheets implementation) performed better than those in control group (i.e. students taught using traditional method). This is an indication that students taught with spreadsheets implementation method performed significantly better than those taught with traditional method. In the same vein, Ugwuadu (2010) in the study on the effect of guided inquiry and self methods on students' academic performance in physics: a case study of Yola north local government area of Adamawa State, revealed that mean pretest scores of the experimental and control groups used for the study are insignificant. The mean posttest scores showed a wide difference. There is a significant difference between the performances of students taught with guided inquiry and those taught with self method in favour of guided inquiry. Guided inquiry proved more effective than self method in enhancing students' academic performance in physics.

The findings on research question two shows the difference in students' performance in Physics between male and female students taught with the spreadsheets implementation teaching method showed that there is no difference in students' performance in Physics between male and female students taught with the spreadsheets implementation teaching method. Hypothesis 2 also revealed that there is no significant difference in students' means performance test score in Physics between male and female students taught with the spreadsheets implementation teaching method. This showed that male and female students taught with guided teaching method performed equally well. Ezenwani (2002) opined that the emphasis on instruction should be to enable student to participate in the process of knowledge not in its product. He asserted that knowledge is a process not a product, and that a student must make an active response for learning to occur. According to him, the student must be guided to develop interest in the learning process. What has to be taught, when and how to teach it are all curriculum questions that must be carefully answered for the purpose of guiding and stimulating the interest of the student. He recommends the spreadsheets implementation method for the teaching of the sciences at the senior secondary schools. Allen (2002) saw spreadsheets implementation as characterized by convergent thinking. The instructor devices a series of statement or questions that guide the learners, step by step, making a series of discoveries that leads

to a single predetermined goal. In other words, the instructor initiates a stimulus and the learner reacts by engaging in active inquiry thereby discovering the appropriate responses.

The findings on research question three the difference between male and female students' performance in Physics taught with cooperative learning method showed that there is no difference between male and female students' performance in Physics taught with cooperative learning method. However, hypothesis 3 revealed that there is no significant difference between male and female students' mean performance test score in Physics taught with self method of teaching. This showed that male and female students' performance in Physics taught with cooperative learning method, has no significance difference. In line with this, Orlich et al (2010) said that 57 it is the taking of self notes which is the key factor in converting the potentially passive experience of listening to a self into the active experience of learning a self. According to them self retain a major educational role because they exploit evolved aspects of human nature to make learning easier and more effective. According to Hillier (2005) "self" as a teaching method makes it easier for information from spoken communication from reading, as it makes students focus attention and remember what is said that when students are required to work alone.

The findings on research question four shows the difference in students' performance in Physics between students in Female schools and students in Male schools taught with spreadsheets implementation teaching method, showed that there is a difference in students' performance in Physics between students in Female schools and students in Male schools taught with spreadsheets implementation teaching method. Hypothesis 4 tested also revealed that there is a significant difference in students' mean performance test score in Physics between students in Female schools and those in Male schools taught with spreadsheets implementation teaching method. Students in Male areas performed better than those in the Female area taught with spreadsheets implementation teaching method. In relation to this, many researchers have come out with the view that students in Male area achieve better than those in Female areas. The poor performance of students in Physics could be attributed to lack of Physics teachers. Majority of schools in Male areas are over staffed with professionally qualified teachers whereas this is not so with Female schools. On the issue of students' poor performance in Physics, Konyeme (2007) and Umar (2008) note that inadequate supply of qualified science and Physics teachers (in terms of quantity and quality) in our secondary schools especially in the Female areas, is responsible for students' low interest in science and Physics, hence, poor performance in the subject by students. Osokoya and Akuche (2012) investigated the effect of school location on students' learning outcomes in practical physics with 526 students from eight co-educational schools in Ibadan with four schools from Ibadan city and four schools from the Female areas of Ibadan. The results supports the hypothesis tested that school location has a significant effect on students' cognitive attainment, the difference between Male and Female Students' Performance in Physics when taught with Self Method of Teaching.

5. Conclusion

Based on the findings gathered from the test of the hypotheses that directed the study, the following conclusion was made;

1. There is a significant difference in students' performance in Physics between students taught using the spreadsheets implementation teaching method and those taught using the cooperative learning method.
2. Those taught with spreadsheets implementation teaching method performed better than those taught with cooperative learning method.
3. There is no difference in students' performance in Physics between male and female students taught with the spreadsheets implementation teaching method.
4. There is a difference in students' performance in Physics between students in Female schools and students in Male schools taught with spreadsheets implementation teaching method.
5. Students in the Male areas performed better than students in Female areas in terms of students' performance in Physics in cooperative learning method.

6. Recommendation

1. Spreadsheets implementation teaching method should be practiced intensively by Physics teachers since the method has been proved effective in enhancing students' academic performance.
2. Physics teachers should reduce the use of self method in teaching Physics to enhance students' academic performance.
3. Physics teachers should make the teaching-learning of Physics an interactive and activity-based for the students using spreadsheets implementation method.
4. Government at all levels should periodically conduct regular workshops for teachers on the effective use of spreadsheets implementation teaching method.
5. Government should also encourage Physics teachers to use spreadsheets implementation method by providing the needed conducive environment for teaching and learning with adequate instructional materials.

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