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Effect of Mind Mapping Instructional Strategy on Upper Basic Education Three Students' Achievement and Retention in Statistics in Agatu Local Government Area, Benue State, Nigeria

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Abstract

This study investigated the Effect of Mind Mapping Instructional Strategy on Upper Basic Education Three Students' Achievement and Retention in Statistics. The study was carried out in Agatu Local Government Area, Benue State, Nigeria. It adopted quasi-experimental non-equivalent group research design (precisely non-randomized pre-test post-test control group design) and multistage sampling to select 80 Upper Basic Education Three students of which 42 were males and 38 females. Two schools were each assigned to experimental and control groups by the use of simple random sampling technique. The experimental

group was taught Statistical concepts using Mind Mapping instructional strategy while the control group was also taught Statistical concepts using conventional methods. The data required for the study were collected using Statistics Achievement Test (SAT) and Statistics Retention Test (SRT) with the reliability coefficient of 0.89 determined using Kuder-Richardson formula 20 (KR20). Four research questions and four hypotheses guided the study. Mean was used to answer the research questions while the hypotheses were tested at 0.05 significant level using analysis of covariance (ANCOVA). Results from the analysis revealed that students exposed to experimental group were superior in achievement and retention than those in the control group. Also, the achievement scores of male and female students were not statistically significant but the retention scores of male and female students were statistically significant. In conclusion, we can say from the study that when Mathematics teachers make use of Mind Mapping instructional strategy, it can improve students' achievement and retention in Statistics since Mind Mapping instructional strategy was the reason for students' high achievement and retention in Statistics. The study therefore recommended amongst others, the training of Mathematics teachers on the use of Mind mapping instructional strategy.

Keywords: Statistics, Mind Mapping, Achievement, Retention, Statistics Education

Introduction

Education is the totality of life experiences that people acquire, and which enable them to cope with and derive satisfaction from living in the world. It is on this premise that it is believed that the quality of a nation's education is proportional to the level of its prosperity. Today, it is a reality to say that the standard of living of a nation is dependent on the level of science and technology of that nation. While science is the bedrock of technology, Mathematics is the gate and key to sciences.

Mathematics is defined as a science that deals with the logic of shape, quantity and arrangement (Elaine, 2013). Elaine further expatiated that Mathematics is all around us, in everything we do, as it is the building block for everything in our daily lives including architecture, art, money, engineering and sport. An average man needs Mathematics to survive no matter how momentary. Mathematics provides the structure and methodology for the study of virtually all the important modern disciplines, and also provides an important key to the understanding of the world in which we live (Abakpa, Anyor & Olaifa, 2017). Emphasis on sound mathematical knowledge for pupils and students in primary and secondary schools is therefore for them to be able to reap the benefits of the acquisition of mathematical skills, live a better life and also be in a better position to directly or indirectly contribute to the development of the society and to the world's economy (Anaduaka, 2010).

The importance of Mathematics to nation building has led the Federal Government of Nigeria to make Mathematics a core subject to be offered by students at the basic, secondary and tertiary levels of education in Nigeria (FRN, 2013). Also, credit pass in Mathematics is compulsory in gaining admission into tertiary institutions for all science-based courses in Nigeria.

Despite the huge importance of Mathematics in nation building, students' achievement in the subject particularly in public examinations is quite low (Nizoloman &

Isa, 2017). Okeke and Ezeh (2011) identified poor teaching methods as the major factor contributing to the poor achievement of students in mathematics while Ajai and Imoko (2015) identified gender differences. Iji, Ogbole, and Uka (2014) identified lack of appropriate instructional materials for teaching Mathematics at all levels of education in Nigeria. Abakpa and Anyagh (2015) identified students' attitude and poor command of English language as well as disregard for the correct interpretation of questions before attempting them among others. It is possible that these factors act jointly or singly to affect students' achievement in Mathematics. It is therefore possible that instructional strategy of teaching this subject contributed to students' poor achievement in Mathematics. It is in line with this that this study focuses on whether the use of Mind Mapping Instructional strategy will improve students' achievement and retention in Mathematics at Upper Basic Three.

Mind Mapping is a diagram used to represent words, ideas, tasks or other items linked to and arranged radially around a central key word or idea. It allows the teacher and students set out to organize a written form to make it easy for the mind to recall and retrieve information (Buzan, 2005). According to Wandersee (2008) the diagram facilitates the students for construction and organization of concepts. Similarly, Buzan (2002) considers diagrams as the easiest way to enable the mind to receive and retrieve information through linking the right hemisphere with the left hemisphere. Therefore, diagrams are able to strengthen the memory more than ten times.

Mind Mapping is considered as a technique that relies on a chart in a particular topic in one page in an organized, sequential and artistic way. In mind mapping, words are substituted with brief and nice graphs that are easy to remember which resembles the functioning of the human brain. The main idea ramifies from the center to the branches based on a specific taxonomy. It provides learners with an organized and miniaturized content and facilitates the flexibility of adding new information easily. Mind Mapping shares the use of colors and texture which initiate from a center and then ramify the lines. It is used to generate visual structure, classify ideas, and as an aid in study, organization, problem solving and decision making.

According to Fryer and Bovee (2016), learning is accompanied by cognitive strategies for knowledge achievement, retention, cooperative and collaborative learning, problem-solving, critical thinking and transformative learning. The present study therefore investigates if using mind mapping instructional strategy would lead to students' higher achievement and retention in Mathematics.

Achievement is the measurement of accomplishment in a specific field of study. Achievement is scholastic standing of a student at a given moment. It has to do with the successful accomplishment of goals. The purpose of testing for achievement is to help the teacher and the students evaluate and estimate the degree of success attained in learning a given concept. It is also useful in testing the retention of information and skill. It is equally appropriate in determining the efficiency of instruction. Achievement means a thing that somebody has done successfully especially using one's effort and skill. Achievement refers to the individual's or group's performance after a specified course of instruction. According

to Alfmio in Iji, Omenka and Akpan (2017) academic achievement shows students' performance on a standard of measurement such as performance test, skill test and analytical thinking test. Achievement is something important that you succeed in doing by your own efforts. Thus, will upper basic three students' achievement and retention improve when they are taught Mathematics using Mind Mapping strategy?

Retention means recalling pieces of knowledge, process and skills that were learned earlier in time. The existence of academic institutions is based in large part on the belief that students remember what they learn. Retention may serve as a prerequisite to good achievement is considered simply as having the power of recalling Mathematical concepts. It is the ability of the working memory of an individual to retrieve stored information from long- term- memory for processing (Zakariyya, 2014).

Retention is the ability to remember things. Retention is the ability to retain what has been learnt. Therefore, the performance of students is proportional to the amount of information retained and the extent of achievement has to do with the degree of retention. Abakpa, Anyor and Olaifa (2017) have observed that long term memory retention is a significant goal of education. Ezeh (1992) argues that knowledge retention is related to the way the concept is taught to the learners and the teacher's method of teaching may be responsible to guide students in the process of learning. Students' low retention in Mathematics may be due to non-utilization of interactive materials in the classroom. Thus, there is a need to explore instructional strategies that will enhance retention of knowledge of male and female students.

Gender of learners is one of the factors that affect students' academic achievement. Over some decades there has been evidence of growing gender gap in educational achievement in many countries. Gender bias in education is responsible for the inequality in opportunity, access, enrollment, curriculum, subject disciplines and several others. Review of studies show inconsistencies on results of male and female students' achievement in Mathematics public examinations and in Mathematics achievement tests. Studies earlier revealed that male students performed better than female students in Mathematics achievement (Ajai & Imoko, 2015). Also report from other studies all show no significant differences among male and female students in Mathematics tests. Contrary to this reports, Achor, Imoko and Ajah (2012) found that female students performed better than male students in Mathematics. It is as a result of the above unresolved controversy that this research is attempted to resolve the differences in achievement and retention on gender in Mathematics, specifically statistics, at Basic Nine using Mind Mapping Instructional Strategy.

From the National Curriculum for Senior Secondary Schools, Mathematics is divided into five sections which include Number and Numeration, Algebraic Process, Geometry, Statistics and Probability. The focus of this study is Statistics. This is because, Statistics is one of the aspects of Mathematics that is dreadful to students and consequently, may have contributed to poor achievement in Mathematics at Basic Education Certificate Examination. Also, Statistics is one of the aspects of Mathematics that is taught at Upper basic Education three level as contain in the Junior Secondary School Curriculum. Statistics

as a branch of Mathematics is a body of theory and methodology employed in analyzing data and using numerical evidence to choose among several alternatives, decisions and actions when all relevant facts are not known (National Teachers' Institute, 2014). It is the science comprising rules and procedures for collecting, organizing, summarizing, analyzing and interpreting numerical data which are used in making decisions, valid estimates, prediction and generalizations (Salami, 2011). In recognition of the enormous importance of statistics, it is studied as an aspect of Junior Secondary School Mathematics.

Federal Ministry of Education (2013) defined Statistics as the branch of Mathematics involving the study of data presentation, measures of central tendency, measures of dispersion, graphical presentation of data and probability. Statistics is an indispensable aspect of Mathematics that affects virtually every facet of human endeavor. Students are expected to apply the knowledge of Statistics in both familiar and unfamiliar situations. Therefore, will upper basic education three students' achievement and retention improve when taught Statistics using Mind Mapping Instructional Strategy?

Statement of the Problem

The roles of Mathematics in national development cannot be over-emphasized. The importance of Mathematics to the nation has led the Federal Government of Nigeria to make Mathematics a core subject to be offered by students at all levels of education. Also, credit pass in the subject is compulsory to gain admission into tertiary institutions for all science-based courses in Nigeria schools. Unfortunately, students' achievement and retention in Mathematics has been very low (Nizoloman, 2013). Research evidence such as (Akinoso 2010; Okeke 2012; Adedayo 2015; and Obioma 2014) have consistently implicated teaching method as a major factor in students' low achievement and retention in Mathematics. Therefore, there is need to explore more instructional strategies in the quest to enhance students' achievement and retention in Mathematics. Mind Mapping Instructional Strategy is one of such strategies that researchers are exploring its efficacy.

Also, Statistics is regarded as a core content area of school Mathematics, but the students achieve low in this area. Team Examiners' Report of Basic Education Certificate Examination (2017, 2018, 2019 & 2020) pointed out that apart from not giving answers to the required degree of accuracy, majority of the candidates could not apply some basic concepts in Statistics correctly in some areas of syllabus. Such areas of the syllabus as reported included: Find median and mode from frequency table, inability to differentiate between frequency and cumulative frequency, weak in Histogram, pictogram and range among others. Although a lot of research have been carried out on students' achievement and retention in Statistics using other methods like, Concept Mapping, Guided Discovery Approach, Self-Regulated Learning Strategy among others. Few have ever utilized Mind Mapping in their area of study. It is in line with this that this study investigated the efficacy of Mind Mapping Instructional Strategy on Students' achievement and retention in Statistics at upper basic education three. Also, the study concerned whether there will be gender gap in mean achievement scores of male and female students taught Statistics using Mind Mapping instructional strategy? Will there be gender gap in mean retention scores of male and female students taught Statistics using Mind Mapping instructional Strategy?

Objectives of the Study

The main purpose of this study was to investigate the effect of Mind Mapping Instructional Strategy on Upper Basic Education three students' Achievement and Retention in Statistics. Specifically, the study seeks to:

- i. determine the difference if it exists in mean achievement scores of upper basic education three students taught Statistics using Mind Mapping Instructional strategy and conventional strategy.
- ii. find out the difference if it exists in mean achievement scores of Male and Female upper basic education three students taught Statistics using Mind Mapping Instructional strategy.
- iii. determine the difference if it exists in mean retention scores of upper basic education three students taught Statistics using Mind Mapping Instructional Strategy and those taught with conventional strategy.
- iv. determine the difference if it exists in mean retention scores of male and female upper basic education three students taught Statistics using Mind Mapping Instructional Strategy.

Research Questions

The following questions provided guide to the research:

- i. What is the difference in mean achievement scores of students taught Statistics using Mind Mapping Instructional Strategy and those taught with conventional methods?
- ii. What is the difference in mean achievement scores of male and female students taught Statistics using Mind Mapping Instructional Strategy?
- iii. What is the difference in mean retention scores of students taught Statistics using Mind Mapping Instructional Strategy and those taught with conventional methods?
- iv. What is the difference in mean retention scores of male and female students taught Statistics using Mind Mapping Instructional Strategy?

Research Hypotheses

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

- i. There is no significant difference in mean achievement scores of students taught Statistics using Mind Mapping Instructional Strategy and those taught with conventional method.
- ii. There is no significant difference in mean achievement scores of male and female students taught Statistics using Mind Mapping Instructional Strategy.

- iii. There is no significant difference in mean retention scores of students taught using Mind Mapping Instructional Strategy and those taught Statistics with conventional method.
- iv. There is no significant difference in mean retention scores of male and female students taught Statistics using Mind Mapping Instructional Strategy.

Methodology

The design adopted quasi-experimental non-equivalent group design. Precisely the non-randomized pre-test post-test control group design was used. The research was conducted in Agatu Local Government Area, Benue State, Nigeria. Agatu Local Government Area was chosen for this study because of consistent poor performance of students in Basic Education Certificate Examination in Mathematics (Team Examiners Report, 2017, 2018, 2019 & 2020) and as well as the accessibility of the researcher to visit the research area which would enable him to carryout regular visit to the sampled schools so as to monitor the research assistants since they needed to comply with the research instructions and conditions.

The population of this study was 2,680 Upper Basic Education Three Students consisting of 1,540 males and 1,140 females. This was obtained from 16 Government Approved Secondary Schools in Agatu Local Government Area.

The sample size of this study was 80 Upper Basic Education III students comprising 42 males and 38 females. Out of this, 40 consisting 21 male and 19 female students were used in experimental group while 40 consisting of 21 male and 19 female students were used in control group. Multi-stage sampling techniques were used for the study because different sampling techniques were used at different stage of the study.

Two instruments were used for data collection. They included Statistics Achievement Test (SAT) and Statistics Retention Test (SRT). Data collected were subjected to both descriptive and inferential statistics. Research questions were answered using mean and standard deviation, while the hypotheses were tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance.

Results

The results of this study are presented according to corresponding research questions and hypotheses.

Research Question One

What is the difference in mean achievement scores of students taught Statistics using Mind Mapping instructional strategy and those taught with conventional methods?

To answer this question, the mean and mean difference in the achievement scores of students taught Statistics using Mind mapping instructional strategy and those taught with conventional methods are computed and presented in Table 1.

TABLE 1: The Mean and mean difference Achievement Scores of Control Group and Experimental Group of Students taught

Group	N	Pre- Test	Post- Test	Mean Difference
		Mean	Mean	
Control	40	23.00	44.58	12.92
Experimental	40	22.50	57.50	

In Table 1, the mean score for pre-test is 23.00 and post-test is 44.58 for the control group. Also in table 1, the mean score for pre-test is 22.50 and post-test is 57.50 for the experimental group. The mean difference was 12.92 in favour of experimental group.

Research Hypothesis One

There is no significant difference in mean achievement scores of students taught Statistics using Mind Mapping instructional strategy and those taught with conventional method.

To test the hypothesis, the ANCOVA results of students taught Statistics using Mind Mapping instructional strategy and those taught with conventional methods are computed and presented in Table 2.

TABLE 2: Summary of Analysis of Covariance (ANCOVA) on Pre-Test and Post-Test Statistics Achievement Test of Control and Experimental group

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	5285.580 ^a	2	2642.790	23.747	.000
Intercept	23358.870	1	23358.870	209.892	.000
PRET	1944.467	1	1944.467	17.472	.000
GUP	3460.491	1	3460.491	31.094	.000
Error	8569.308	77	111.290		
Total	222241.000	80			
Corrected Total	13854.887	79			

a. R Square=.381 (Adjusted R Square= .365)

In Table 2, $F_{(1, 79)} = 31.094$ with p-value of 0.000 which is less than the α -value of 0.05. This means that null hypothesis is rejected. This implies that there is a significant difference in mean achievement scores of students taught Statistics using Mind Mapping instructional strategy. The students taught Statistics using Mind Mapping instructional strategy scored higher in achievement test than those taught with conventional teaching method.

Research Question Two

What is the mean difference in achievement scores of male and female students’ taught Statistics using Mind Mapping instructional strategy?

To answer this question, the mean achievement score of male and female students taught Statistics using Mind Mapping instructional strategy are computed and presented in Table 3.

TABLE 3: The mean and mean difference of Pre-Test and Post-Test of male and female students taught Statistics in Experimental Group.

Gender	N	Pre –Test	Post –Test	Mean Difference
		Mean	Mean	
Male	21	23.95	59.20	3.45
Female	19	21.05	55.80	

In Table 3, the mean scores of male students’ pre-test was 23.95 and post-test was 59.20 for the experimental group. Also in table 3, the mean scores of female students’ pre-test was 21.05 and post-test was 55.80 for the experimental group. The mean difference in the post test was 3.4 in favour of male students.

Research Hypothesis Two

There is no significant difference in mean achievement scores of male and female students taught Statistics using Mind Mapping instructional strategy.

To test the hypothesis, the ANCOVA results of students taught Statistics using Mind Mapping instructional are computed and presented in Table 4.

TABLE 4: Summary of Analysis of Covariance (ANCOVA) on Pre-Test and post-Test Statistics achievement scores of male and female students taught Statistics in Experimental Group

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1360.358 ^a	2	680.179	4.114	.024
Intercept	10259.120	1	10259.120	62.048	.000
PRET	1244.758	1	1244.758	7.528	.009
GEN	24.547	1	24.547	.148	.702
Error	6117.642	37	165.342		
Total	139728.000	40			
Corrected Total	7478.000	39			

a.R Square= .182 (Adjusted R Square= .138)

In Table 4, $F_{(1,39)}=0.149$ with p-value of 0.702 which is greater than the alpha value of 0.05. This means that the null hypothesis is not rejected. This implies that there is no significant difference in the achievement scores of male and female students taught Statistics using Mind Mapping instructional strategy.

Research Question Three

What is the difference in mean retention scores of students taught using Mind Mapping instructional strategy and those taught with conventional methods?

To answer this question, the mean retention scores of students taught using Mind Mapping instructional strategy and those taught with conventional methods are computed and presented in Table 5.

TABLE 5: The Mean and mean difference of Control and Experimental groups on retention scores of students

Group	N	Post- Test	Retention-Test	Mean Difference
		Mean	Mean	
Control	40	44.58	41.08	3.50
Experimental	40	57.50	55.95	1.55

In Table 5, the mean scores for the post-test were 44.58 and 57.500 for the control group and experimental group. Also in table 5, the mean retention scores are 41.08 for the control group and 55.95 for the experimental group. The mean difference for the control group was 3.5 and experimental group was 1.55. This implies that the students taught Statistics using Mind Mapping instructional strategy have a higher retention score than those taught Statistics using conventional teaching method.

Research Hypothesis Three

There is no significant difference in mean retention scores of students taught Statistics using Mind Mapping instructional strategy and those taught with conventional methods.

To test the hypothesis, the ANCOVA results of students taught Statistics using Mind Mapping instructional strategy and those taught with conventional methods are computed and presented in Table 6.

TABLE 6: Summary of Analysis of Covariance (ANCOVA) on post-Test and Retention-Test in Statistics retention-test of the students taught in Experimental Group.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	14080.376 ^a	2	7040.188	8.07155	.000
Intercept	.604	1	.604	.069	.793

POST	9655.064	1	9655.064	1106.949	.000
GUT	94.028	1	84.028	10.780	.002
Error	671.611	77	8.722		
Total	203029.000	80			
Corrected Total	14751.987	79			

a.R Square= .954 (Adjusted R Square= .953)

In Table 6, $F_{(1,79)}=10.800$ with p-value of 0.002 which is less than the α -value of 0.05. This means that the null hypothesis is rejected. This implies that there is a significant difference in mean retention scores between the students taught Statistics using Mind Mapping instructional strategy and those taught using conventional method. The students taught Statistics using Mind Mapping instructional strategy retained higher scores than those taught Statistics using conventional teaching method.

Research Question Four

What is the difference in mean retention scores of male and female students taught Statistics using Mind Mapping instructional strategy?

To answer this research question, the mean retention scores of students taught using Mind Mapping instructional strategy are computed and presented in Table 7.

TABLE 7: The Mean and mean difference in Retention scores of Male and Female Students taught in experimental group.

Gender	N	Post-Test	Retention-Test	Mean Difference
		Mean	Mean	
Male	21	59.20	56.45	2.75
Female	19	55.80	55.45	0.35

In Table 7, the mean scores of male students' post-test is 59.20 and 55.80. Also in table 7, the mean scores of male students' retention scores are 56.45 and 55.45 for the retention test. The mean difference is 2.75 and 0.35 in favour of male students.

Research Hypothesis Four

There is no significant difference in mean retention scores of male and female students taught Statistics using Mind Mapping instructional strategy.

To test the hypothesis, the ANCOVA results of male and female students taught Statistics using Mind Mapping instructional strategy are computed and presented in Table 8.

TABLE 8: Summary of Analysis of Covariance (ANCOVA) results of Statistics retention test of male and female students taught Statistics in Experimental Group

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	6835.753 ^a	2	3417.875	1372.382	.000
Intercept	.722	1	.722	.290	.593
POST	6825.753	1	6825.753	2740.749	.000
GEN	50.900	1	50.900	20.438	.000
Error	92.147	37	2.490		
Total	132144.000	40			
Corrected Total	6927.900	39			

a. R Square = .987 (Adjusted R Square = .896)

In Table 8, $F_{(1,39)} = 20.438$ with p-value of 0.000 which is less than the α -value of 0.05. This means that the null hypothesis is rejected. We therefore conclude that there is significant difference in retention scores between the male and the female students taught Statistics using Mind Mapping instructional strategy. The male students taught Statistics using Mind Mapping instructional strategy retained higher scores than the female students.

Discussion

The test of hypothesis results in Table 2 reveals that there is significant difference in the mean achievement scores of students taught Statistics using Mind Mapping instructional strategy than those taught Statistics using conventional method. This implies that Mind Mapping teaching method can influence students' achievement in Statistics. This result is supporting the finding by Adodo (2013) that Mind Mapping strategy helped to improve students' performance. This study also supports the study of Okeke and Ezeh (2011) that Mind Mapping was more effective in achievement of students. Also, this study is in line with Jibrin, Shehui and Abdullahi (2012) that students taught using Mind Mapping instructional strategy significantly achieved higher than those taught using lecture method. Furthermore, the mean achievement scores of male students taught Statistics using Mind Mapping instructional strategy was higher than their female counterparts in the Statistics achievement test and their mean difference was not statistically significant. The finding in this study is in contrary to the study of Obiak (2005) which shows that though female students were more interested, the male students performed higher in achievement test than their female counterparts.

The result in Table 5 shows that students taught using Mind Mapping instructional strategy retained higher scores than those taught using conventional teaching method. The finding of this study agrees with Okeke and Ezeh (2011) who found out that Mind Mapping was more effective in retention of students than the control group. Also, this study is contrary to the study of Oluwatosin (2015) who found no significant effect in the retention

ability of students taught using Mind Mapping Approach, students taught using both methods having nearly the same scores.

Also, the outcome in Table 8 implies that there was significant difference in the retention scores of male and female students taught Statistics using Mind Mapping Instructional Strategy. The male students mean retention score was higher than the female students. The finding of this study is contrary to the findings of Oluwatosin (2015) who found no significant effect in the retention ability of students taught using Mind Mapping Approach. Thereby male students retained higher scores than their female counterparts. Performance is a function of gender.

Conclusion

In conclusion, since the mean difference of students taught Statistics using Mind Mapping instructional strategy and student taught Statistics using conventional methods is statistically significant, this study therefore concludes that if a Mathematics teacher uses Mind Mapping instructional strategy in teaching Statistics, it will better the achievement of students in Statistics. Also, the use of Mind Mapping instructional strategy in teaching could be the reason why students retained higher scores in Statistics. From this study we can say that when teachers make use of Mind Mapping instructional strategy, it can improve students' achievement and retention in Statistics.

Recommendations

Based on these findings, the study recommended that:

- i. Mind Mapping instructional strategy should be included in the in-service training given to Mathematics teachers by the ministry of education so that they can be efficient in the teaching of Statistics.
- ii. Mind Mapping tools should be provided for schools by school proprietors and governments. This will enable Mathematics teachers to effectively and efficiently use them in teaching of Statistics.
- iii. Mind Mapping instructional strategy should be used by Mathematics teachers in their Statistics classes which could make the students master the learning of Statistics and will enhance their level of achievement.
- iv. Periodic practical oriented workshops and seminars should be organized by the governments and school proprietors for Mathematics teachers on the correct use of Mind Mapping instructional strategy in the teaching of Statistics.

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