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# EFFECTS OF CONCEPT MAPPING STRATEGY ON INTEREST AND ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS IN HISTORY IN PLATEAU NORTH EDUCATIONAL ZONE, NIGERIA

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#### **ABSTRACT**

The study investigated the effects of concept mapping strategy on interest and achievement of senior secondary school students in History in Plateau North Educational Zone, Nigeria. Two hypotheses were formulated for the study. The study employed a quasi-experimental design specifically the pre-test – post – test non – equivalent control group design. All the 20 senior secondary schools in the study area that offer History as a subject constituted the population for the study. Two senior secondary schools among the 20 were purposively selected and made into experimental and control groups. History Achievement Test (HAT) and History Interest Inventory (HII) were prepared by the researcher and validated by two senior lecturers from the Research, Measurement and Evaluation unit, one History and International Studies Education Expert, and one senior lecturer from Educational Psychology all of the University of Jos, Nigeria and a reliability coefficient r = 0.70 was arrived at after pilot testing. The instruments HAT and HII were administered to the students by the researcher with the assistance of two research assistants. Data collected were analysed using t-test and z – test statistics. The results indicated that students taught History topics using concept mapped instructional strategy achieved higher than those taught using lecture strategy. It was recommended that History teachers need to diversify their strategies of teaching historical topics such as concept mapped teaching strategy as it will assist in higher interest and academic achievement of learners in the subject.

**Keywords:** Concept mapping, Strategy, Interest, Achievement, History,

# 1.0 INTRODUCTION

History is the scientific study of significant past events and activities with cause and effect for a better understanding of present events and activities geared towards the effective prediction of future events. It is an analytical and critical assessment to understand significant past events, so that man will understand his environment better and change the present for a better future. It is the memory of the human group experience (Sanda, 2013). If

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History teachers plan, prepare and teach their lessons well, they will promote curiosity in students on what actually happened the previous year, the previous century and /or a thousand years ago. Furthermore, History when taught in schools is important in nurturing the spirit of citizenship and aiding in the foundation of nation-building, it expands human beings' knowledge and understanding of their local, national and international communities. History inculcates the spirit of patriotism, enables individuals to understand what is good and evil; it quickens peoples' imagination; encourages tolerance; and sets children on the road towards awareness of human solidarity and of the great truth that no man lives unto himself alone (Ukpanupong, 2011).

Unfortunately, indices from various examination bodies, such as the West African Examination Council (WAEC Examiners Report, 2017) and National Examination Council (NECO Examiners Report, 2017), have shown a consistent trend of low enrolment and poor achievement of students in History examinations due partly due to poor teaching strategies by some History teachers. This has become a thing of concern to the History teachers in Nigeria who are in a dilemma because of people's diminishing interest in the subject. Some of the factors responsible for the declining interest and achievement of students in the discipline are highlighted as follows: preferential treatment to the sciences at the expense of other disciplines, the introduction of Social Studies in the secondary school's curriculum in the 1970s, where students perceived and strongly believed that Social Studies is easier to grasp and pass than History which entailed intensive reading and cramming of dates, the materialistic propensity among parents and their wards as well as the prestige attached to certain professions in our society, the bulkiness of the History syllabus, abstract manner of teaching History also discourages the students, poor teaching strategies and a host of others (Onalapo, 2012).

The way and manner in which history subject was and is being taught affect the interest and achievement level of students in the discipline. Poor teaching strategies used by the History teachers have been perceived to also have contributed to the decline in interest by students in the study of history. Admittedly, the types of strategies that a teacher uses is very important because such strategies serve as a means by which students' interest could be sustained in the activities which results in learning and great achievement academically. Similarly, the lecture note giving and storytelling strategies which are the oldest strategies that are widely used mostly in schools by History teachers are becoming unpopular and contribute significantly to making History lessons dull to the students (Osiyale, 2012). Today, many rewarding and motivating ones like Problem – solving, Mind – mapping, Brain – mapping, Team – teaching, Resource Persons, Devil's Advocate, Debate, Stimulation, Concept mapping, Computer-assisted instruction and a host of others could be used to enhance students' interest in the subject.

Strategies are vehicles in which the objectives ride to success, but no matter how good the objectives are, a poorly selected strategy can affect the achievement of the objectives. Some teachers consider the selection of strategies as an area where they have an exclusive monopoly, however, no matter how good a topic to be taught is, if the strategy is not in consonance with the topic and level of maturity of learners, little or no success will be achieved (Osiyale, 2012).

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Concept mapping as opined by Nwani (2014) is a graphic strategy organized hierarchically to show the relationships among concepts in a graphic form. It is a meta-learning strategy for assisting learners to organise information about concepts in a meaningful manner in order to facilitate meaningful learning. The concepts are associated with one another through linking words that join the concepts to give them significance. Concepts maps are diagrammatic representations that show meaningful relationships between concepts in form of propositions which are linked together by words, circles, and cross-links. Concepts are arranged hierarchically with superordinate concepts at the top of the map and subordinate at the bottom which is less inclusive than higher ones. "Crosslinks" are used to connect different segments of the concepts hierarchy, which indicate syntheses of related concepts, a new interpretation of old ideas, and some degree of creative thinking (Manjula, 2016). Concept mapping is an easily understood tool. It is a strategy where concepts of knowledge are presented by a graphical display that facilitates knowledge management and exchange. This also helps to personalise the learning process. Concept mapping helps students to brainstorm and generate new ideas. It encourages students to discover new concepts and the propositions that connect them and also allowing students to more clearly communicate ideas and information. It also assists those who intend to generate, transmit, store and spread information and knowledge.

Although interest in a subject does not guarantee success in the subject, studies have however shown a very high degree of correlation between interest in a subject and success in the learning of such subject. It is, therefore, appropriate to say that interest in a subject makes the learning easier, faster and more lasting (Okonkwo, 2012).

What could be done to reduce the various problems that mar the application of concept mapping strategy in the teaching of History and how to inject new attitudes towards enhancing the learning of the subject? This is the ultimate reason for conceiving the concept mapping teaching strategy for the effective teaching and learning of History subject which is on the edge of a precipice because of students' lack of interest and ultimate poor achievement in the discipline. It is, therefore, necessary to examine the effect of concept mapping on students' interest and achievement in History in Plateau North Educational Zone, Nigeria.

# 2.0 AIM AND OBJECTIVES OF THE STUDY

The main aim of this study is to determine the Effects of Concept Mapping Strategy on Senior Secondary School Students' interest and achievement in History in the Plateau North Educational Zone, Nigeria. Specifically, the objectives of this study will be to:

- 1. Determine the effects of concept mapping on students' achievement before and after treatment in History in Plateau North Educational Zone, Nigeria.
- 2. Ascertain students' interest in History before and after exposure to concept mapping strategy in Plateau North Educational Zone, Nigeria.

# 3.0 RESEARCH QUESTIONS

To guide this study, the following research questions have been raised.

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- 1. What are the achievement mean scores of students in History before and after exposure to concept mapping strategy in Plateau North Educational Zone, Nigeria?
- 2. What is the level of students' interest in History before and after exposure to concept mapping in Plateau North Educational Zone, Nigeria?

#### 4.0 RESEARCH HYPOTHESES

The following hypotheses have been formulated and will be tested at a 0.05 level of significance.

- 1. There is no significant difference in the achievement mean scores between the experimental and control groups after exposure to concept mapping strategy in Plateau North Educational Zone, Nigeria.
- 2. There is no significant difference in the interest mean scores between the experimental and control groups before and after exposure to concept mapping strategy in Plateau North Educational Zone, Nigeria.

#### **5.0 METHOD**

The research design employed for this study was quasi-experimental. It is a pretest-posttest non – equivalent control group design. This is because the researcher cannot randomly sample and assign the subjects to experimental groups. They are already in their intact classes where it is not possible to assign the subjects to experimental and control groups (Nworgu, 2006).

This study was conducted in the Plateau North Educational Zone of Plateau State. The zone comprised of 53 Secondary Schools in six Local Government Areas namely: Bassa, Jos North, Jos South, Jos East, Riyom and Barkin Ladi LGAs. The justification for the choice of the Zone is based on the fact that the Zonal Inspector of Education commented that the students had not been doing well in History as a subject. Another reason for the choice of the Zone is also based on the fact that most of the schools have a similar number of facilities in terms of equipment, staff strength, staff qualifications among others. This will give enough room for the random selection of the samples. All the senior secondary school two (SS2) History students in all the government-owned secondary schools in Plateau North Educational Zone 2018 / 2019 Academic Session forms the population of the study, thus the population of the study was 120 which comprised of 56 males and 64 females (From the Zonal Director Plateau Northern Educational Zone, 2018). The choice of SS2 History students was because it was not yet an examination class, but preparing for the Senior Secondary Certificate Examination (SSCE). The sample consisted of 45 students comprising 25 students for the Control group and 20 for the experimental group who form the intact classes. The Control group comprised 9 male and 11 female students, while the Experimental group comprised 12 male and 13 female students. The two intact classes were both public schools that were used for the study. The two classes found in the two schools were randomly assigned to experimental and control groups.

Purposive sampling technique was used in selecting one Local Government Area out of the six LGAs' in Plateau North Educational Zone. In the same vein, the purposive sampling

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technique was used in selecting two schools from the LGA. The purposive sampling technique was used in order to pick the schools with common characteristics such as school type, well – equipped school library, classroom facilities, History teachers qualifications and to actually select schools that History as a subject is been taught. The justification for the use of the purposive sampling technique was also to get a fair representation from each of the Local Government Areas in the Zone. A simple random sampling technique was used to assign classes to experimental and control groups

The instruments used for this study are History Achievement Test (HAT) and History Interest Inventory (HII). The HAT instrument was developed to covered colonialism and slave trade topics contained in the SS2 History Curriculum. The HAT was a fifty (50) item objectives test questions and five (5) essay short answer questions, while HII has thirty (30) questions and statement items for students on their interest all constructed using a Table of the specification. The 30 items History Interest Inventory (HII) was subjected to Facto – Analysis by an expert in that area. The reliability of the instrument was done using Kuder – Richardson (K-R) formula 21 and the value was 0.86. Lesson plans for both the experimental and the control groups were used for the study.

The experimental procedure began with the training of the two History teachers in both schools. This took place during the first term break of the school which lasted for five days. The teachers were trained in the use of two teaching strategies. Also, the contents, objectives and activities of the students were discussed during the training. The lesson plans for both the experimental and control groups are the same in terms of their content, instructional objectives and evaluations but defer in the instructional strategy used. The students were pretested before teaching. The experiment lasted for five weeks after which the post-test was administered to two groups.

The scores for both tests were collected and the researchers scored the scripts. To reduce the error that might arise as a result of teacher differences, all the two History teachers that were used for the study were the regular class teachers in the schools. The teachers taught both the experimental and the control group in each school. All the teachers were given the same lesson plans to maintain uniformity. The lesson plans were extensively discussed during the training under the supervision of the researchers. The teaching for both experimental and control groups was not done by the researchers but by the regular class teachers. The pretest and posttest administration gap was four weeks and the period was long enough not to permit pretest to affect posttest scores and also to prevent students from becoming familiar with test items.

The descriptive statistical tools of mean and standard deviation scores were used to answer the research questions while null hypotheses formulated was tested using the inferential statistical tools of Independent Samples t-test statistic and analysis of covariance (ANCOVA) were used to test the hypotheses at the 0.05 alpha levels.

#### 6.0 RESULTS

Table 1: Pretest and posttest mean achievement scores and standard deviations scores of Senior Secondary School Students in History due to teaching strategy.

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| Teaching<br>Strategy | Number of<br>Students |                | Types of Test |                |      | Achievement Gain      |                       |  |
|----------------------|-----------------------|----------------|---------------|----------------|------|-----------------------|-----------------------|--|
|                      |                       | Pre-test       |               | Post-test      |      |                       |                       |  |
|                      | N                     | $\overline{X}$ | S.D           | $\overline{X}$ | S.D  | $\overline{X}$ - Gain | $\overline{X}$ – diff |  |
| Experimental group   | 20                    | 22.60          | 3.76          | 62.00          | 6.14 | 39.4                  |                       |  |
|                      |                       |                |               |                |      |                       | 28.00                 |  |
| Control group        | 25                    | 18.96          | 3.02          | 30.40          | 4.20 | 11.4                  |                       |  |
|                      |                       |                |               |                |      |                       |                       |  |

#### X – Diff – mean difference

Table 1, showed that the experimental group had a mean score of 22.60 with a standard deviation of 3.76 before exposure to treatment and a mean of  $X^-62.00$ , and a standard deviation of 6.14 after exposure to treatment while the control group had a mean of 18.96, the standard deviation of 3.02 before exposure to treatment and  $X^-30.40$ , standard deviation 3.02 after exposure to concept mapping and conventional lecture strategies respectively. The results, shows that the experimental group performed better than the control group after exposure to treatment.

# **Research Question two**

What is the History interest mean scores of SSII students in the experimental and control groups before and after exposure to treatment? The data on students' interest in history before and after treatment is used to answer this research question and is presented in table 2.

Table 2: Pretest and posttest interest mean scores and standard deviations scores of Senior Secondary School Students in History due to teaching strategy.

| 0                   | mber<br>dents | nber of<br>dents |      | Types of       | Test  | Achievement Gain      |                       |  |
|---------------------|---------------|------------------|------|----------------|-------|-----------------------|-----------------------|--|
|                     |               | Pre-             | test | Post-test      |       |                       |                       |  |
|                     | N             | $\overline{X}$   | S.D  | $\overline{X}$ | S.D   | $\overline{X}$ - Gain | $\overline{X}$ – diff |  |
| Experimental. Group | 20            | 80.75            | 5.16 | 88.40          | 6.36  | 7.65                  |                       |  |
|                     |               |                  |      |                |       |                       | 5.93                  |  |
| Control group       | 25            | 74.40            | 8.49 | 76.12          | 11.11 | 1.72                  |                       |  |

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The results of the analysis in table 2 showed the interest mean scores of students towards history. From the results, the experimental group had  $X^-80.75$ , SD 5.16 before treatment and  $X^-88.40$ , SD 6.36 after exposure to treatment while the control group had  $X^-74.40$ , SD 8.49 and  $X^-76.12$ , SD 11.11. This showed that the interest of students in the experimental and control group increased after exposure to treatment but that of the experimental group increased higher than that of the control group, which could be attributed to the effect of the concept mapping strategy.

### **Hypothesis One**

There is no significant difference in the historic achievement mean scores between the experimental and control groups before and after exposure to concept mapping strategy.

Table 3: The results of the t-test analysis of the experimental and control groups before exposure to treatment.

| Category                   | N    | $\overline{X}$ S | D t-va | alue df | P – | value Sig | ·    |
|----------------------------|------|------------------|--------|---------|-----|-----------|------|
|                            |      |                  |        |         |     |           |      |
| Experimental group Pretest | 20   | 22.60            | 3.76   | 2.95    | 43  | 0.86      | 0.05 |
| Control group Pretest      | 25   | 19.40            | 3.23   |         |     |           |      |
| Experimental group Posttes | t 20 | 62.00            | 6.14   | 24.14   | 43  | 0.000     | 0.05 |
| Control group Posttest     | 25   | 29.90            | 4.24   |         |     |           |      |

The results of the analysis in Table 3 pretest showed the t-test analysis of achievement between the experimental and control groups. The table showed that t (43) = 2.95, P > 0.05, since the P-value of 0.86 is greater than the significant level of 0.05. This, therefore, shows that the null hypothesis was accepted implying that there is no significant difference in the achievement mean scores between the experimental and control groups before exposing to treatment. This, therefore, showed that the two groups had the equal ability before treatment.

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The results of the analysis in Table 3 posttest showed that the t (19) = 24. 14, P < 0.05, since the P-value of 0.000 is less than the significant value of 0.05. This, therefore, shows that the null hypothesis was rejected in favour of the alternative hence there is a significant difference in the achievement mean scores between the experimental and control groups after the two groups were exposed to different treatment. This, therefore, showed that concept mapping improved students' achievement in history achievement test more than the lecture method.

# **Hypothesis Two**

There is no significant difference in the interest mean scores between the experimental and control groups before and after exposure to the concept mapping strategy.

Table 4: The results of the t-test analysis of the experimental and control groups before and after exposure to treatment.

| Category                  | N     |       | SD df | t - va | alue | P – value | Sig. |
|---------------------------|-------|-------|-------|--------|------|-----------|------|
|                           |       |       |       |        |      |           |      |
| Experimental group Pretes | st 20 | 80.75 | 5.16  | 43     | 2.99 | 0.07      | 0.05 |
| Control group Pretest     | t 25  | 75.10 | 7.03  |        |      |           |      |
| Experimental group Postte | st 20 | 88.40 | 6.36  | 43     | 6.89 | 0.000     | 0.05 |
| Control group Posttes     | t 25  | 77.80 | 5.05  |        |      |           |      |

The results of the analysis in Table 12 shows that t(19) = 2.99, P > 0.05, since the P-value of 0.07 was greater than the significant level of 0.05. This, therefore, showed that the null hypothesis was accepted implying that there was no significant difference in the interest mean scores between the experimental and control groups before exposure to treatment.

The results of the analysis in Table 13 shows that t(19) = 6.89, P < 0.05, since the P-value of 0.000 was less than the significant level of 0.05. This, therefore, revealed that the null hypothesis was rejected in favour of the alternative hypothesis. Hence there was a significant difference in the interest mean scores between the experimental and control groups after exposure to treatment in favour of the experimental group.

# 7.0 DISCUSSIONS

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The results presented in Table 1 showed that there was a significant difference in the mean academic achievement of students who were taught History using concept mapped instructional strategy and those taught to using conventional strategy. The result is in agreement with that of Madu, Offor, Ebere, Duke-Natrebo, (2017) who reported that students' exposed to Agricultural science using concept map performed better than those exposed to Agricultural science using the conventional method. This is possible because the students were directly involved in the learning process. It was suggested earlier by Mustafa and Murset (2013) that since students were actively involved in the learning process and were able to find out some information for themselves through activity-based instructional strategy such as discovery method, problem-solving and concept map teaching strategy, learning is better facilitated. From the study, it was concluded that the concept map teaching strategy is one of the effective strategies of teaching History at the Senior Secondary School Level since it shows the potentiality of improving students' academic achievement and their interest in the subject.

The results presented in Table 2 showed that the interest of students both in the experimental and control group increased after exposure to treatment but that of the experimental group increased higher than that of the control group which could be attributed to the effect of the concept mapping strategy. Studies from Okonkwo (2012) and Tale (2014) revealed that the teaching strategy employed by the teacher is one of the major factors that influence students' interest and achievement in History. The way students interact with their teachers during instruction may influence their interest in the subject being taught. The use of the concept map strategy in this study involved students actively involved in the History lesson. Thus, it raised students' interest in History. Karakuyu (2010) also emphasized that students had more positive attitudes towards learning when they engaged in drawing the concept map. Thus, their interest in learning History was enhanced compared with the control group. The elements of fun and enjoyment in learning History could also have contributed to enhancing their interest in History. As for the students from the control group, they were more engaged in learning the lesson using lecture method which does not give room for proper interaction between teachers and students. Students listened to the teachers' explanation and copied the notes given by the teacher. The Passive learning environment in the control group failed to enhance their interest in History as experienced by their counterparts in the experimental group. Broggy and George (2016) found out that students' attitude towards physics improved after their experience with concept mapping, while Okonkwo (2012) found out that concept mapping and stimulation game instructional strategies significantly enhanced students' achievement and interest in chemistry.

The result of the analysis of hypothesis two in table 3 revealed a significant difference in the mean achievement scores of students taught history using concept mapping strategy and conventional lecture teaching strategy. This result could mean that students in the experimental groups taught history using concept mapping instructional strategy achieved significant results than the students in the control group. Similarly, the results of Chang (2016)'s mean comparisons test revealed a statistically significant difference between the means of students taught history using concept mapping strategy and those taught using conventional teaching strategy (lecture strategy).

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The finding of this study gives further credence to the outcome of similar works that reported that students exposed to concept mapping strategy demonstrated a greater and in-depth understanding of concepts than those exposed to lecture strategy. Omur, Burcu and Hassan (2016)'s result also agree with some studies which showed that there were statistically significant differences between the means of the experimental and control groups on the posttest administered, in the favour of the experimental groups that studied through concept mapping strategy. Ghorai and Guha (2018) also emphasised that students' performance in Biology as a subject improved significantly after being taught using concept maps. A study conducted by Karakuyu (2010) also showed that instructions given by the teacher and drawing of concept maps significantly improved the achievement of the experimental group in physics compared to the control group who were subjected to the conventional method. Asan (2010) carried out research to determine the effects of incorporating concept maps on the achievement of Fifth Grade students learning Science. This result was contradictory to the reports of (Brandt, 2011) who noted that the mean scores of students in post-test for the experimental and control groups taught using concept mapping and conventional teaching strategy showed the statistically insignificant difference.

The analysis of hypothesis two in table 4 revealed that there is a significant difference in the interest mean scores between the experimental and control groups after exposure to treatment in favour of the experimental group. The results of the present study showed that the pre-test means score of the students in the experimental group was not significantly different from that of the students in the control group. The posttest mean scores of the students' interest in the experimental group was found to be significantly different from that of their counterparts in the control group. This finding has again shown the efficacy of the use of concept mapping strategy in enhancing students' interest in studying a subject. Corroborating this finding, this study showed that the concept mapping strategy was more effective in increasing students' interest than the regular teaching strategy.

The noticeable impact of concept mapping on students' interest recorded in this study may be attributed to the characteristics inherent in the use of concept mapping strategy. Again, this is a confirmation that an observable significant difference is seen in the post-test mean scores of the two groups which could be attributed to the effects of the intervention of the concept mapping strategy. The finding agrees with those of Broggy and George (2016) and Okonkwo (2012) who found out that students' attitude towards physics improved after their experience with concept mapping, and that concept mapping and stimulation game instructional strategies significantly enhanced students' achievement and interest in chemistry respectively. Nair and Narayanasamy (2017)'s findings also indicated that the utilization of the concept map method significantly improved students' achievement and interest in history. The findings also supported the theory of meaningful learning and utilization of concept maps.

#### 8.0 CONCLUSION

From the study, it was concluded that concept mapping teaching strategy is one of the effective strategies of teaching History at the Senior Secondary School Level since it shows the potentiality of improving student's interest and academic achievement in the subject.

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#### 9.0 RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:-

- 1. History teachers need to use a concept mapped teaching strategy so as to improve the academic achievement of students in History.
- 2. There is a need for training History teachers on the effective use of concept mapping teaching strategy in teaching History topics.
- 3. Facilities should be provided by the Federal and State governments as well as PTAs and NGOs for effective use of concept mapped teaching strategy for teaching in senior secondary schools.
- 4. History and International education researchers may replicate and improve this study at a different location and at other education levels in the country.

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