

Concept Mapping Influence on Student Interest in Basic Technology in Junior Secondary School in Yenagoa Local Government Area

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ABSTRACT : This study examined Concept Mapping Influence on Student Interest in Basic Technology in Junior Secondary School in Yenagoa Local Government Area. Quasi-experimental design was used. Two research questions and two hypotheses tested at 0.05 level of significance were used to guide the study. The study population comprised 4502 JSS1I junior secondary school Basic technology students in public schools in Yenagoa Local Government Area of Bayelsa. Sample of 400 JSS11 Basic Technology students was selected by simple random sampling technique for the study. Research instruments for data collection was “Basic Technology Interest Inventory Scale”. The instrument was validated by an expert and three subject teachers. The Reliability of the instrument was established using Pearson Product Moment Correlation Coefficient of 0.73. The collected data were analysed, Mean and Standard Deviation were used to answer the Research questions while z-test was used to test the Hypotheses at 0.05 level of significance. Findings of the study revealed that Students that were exposed to concept mapping instructional strategy had a higher interest in Basic Technology than their counterparts taught using lecture method. Based on the findings it was recommended that Basic Technology teachers should be encouraged to use concept mapping strategy for effective teaching and learning to arouse students’ interest.

Keywords: Concept Mapping, Student’s Interest, Basic Technology .

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INTRODUCTION

Basic Technology is a subject taught at the junior secondary school level in Nigeria. It is the grass root of technology related courses that trains individuals to have technological awareness in the first three years (junior secondary school) of the six years secondary school period. Areas covered includes: basic electrical/electronics, building drawing, wood work, technical drawing, concrete practice and metal work. It is a prevocational subject that gives students opportunities to see what the world of work is like. . This has made Basic Technology to be identified as a very important subject that cannot be ignored in junior secondary schools if, Nigeria has to be technologically and economically developed. For this same reason Basic Technology was separated from Basic Science and has become one of the core subjects among other science related subjects in Nigeria education system in the junior secondary school leve. This will be realised only if, basic Technology is taught using an effective and efficient teaching method that will arouse the interest of the students.

Student Interest in a subject on the other hand, is the concern and attention given by student to a subject such as Basic technology. Interest is the attraction which motivates a child to respond to a particular stimulus. It is a facet of affective domain that deals with one's preparedness to like or dislike something. Sometimes it could be aroused in a person by activity that tends to satisfy the person's need. Interest is an immanent feeling of persisting tendency to pay attention and enjoy some content (Imoko & Agwagah in Jane & Adeola, 2017). Though some students may be intellectually and physically capable of learning, they may never learn until their interest is stirred up. Once the students are stirred up, they will come to learn as long as the teacher is able to sustain their interest in the subject matter. This is because interest is a pre-indication of attention, once there is direct interest, attention is guaranteed and learning is assured (Jane & Adeola, 2017).Interest will result to a better retention of what is being learned by the student. When students are interested in a particular subject, they will pay kin attention and that will increase their retention ability in that subject.

Something could be aroused in a person by activity that tends to satisfy the person's need. Interest is a subjective feeling of concentration or persisting tendency to pay attention and enjoy some activity or content (Imoko & Agwagah in Jane & Adeola, 2017). Though some students may be intellectually and physically capable of learning, they may never learn until their interest is stimulated. Once the students are stimulated, they will come to learn as long as the teacher is capable of sustaining their interest in the subject matter. This is because interest is a sign of attention, once there is direct interest, attention is guaranteed and learning is assured (Jane & Adeola, 2017).

Also, Anderson in Essien, Akpan, and Obot, (2015), reported that interest most often is directly tied to the content or instruction, and it also directs and enhances learning. This means students 'interest in a particular subject will positively affect their academic achievement that is a higher interest in basic technology will yield a higher academic achievement in basic technology. This will result when the content of instruction is presented with an appropriate instructional method .

Teaching methods are the tools of the teacher for reaching the set goals and objectives. Abdulhamid (2013) also maintains that, for effective teaching to take place, the teacher must stimulate, encourage and maintain active participation of the students through the selection of appropriate teaching methods. This would require a balance between what is taught and how it is taught. Thus successful teaching of a subject does not depend only on the teacher's mastery of the subject matter but also the teaching method applied. Squeira (2012) stresses that learning through some methods are passive rather than active.

Lecture Method is the easiest and the most common type of teaching method ,the teacher takes full charge of his class, while students only looks and listens to the teacher. Akpoghol, Samba and Asemave (2013), the lecture method is one of the conventional methods of teaching; it involves only oral presentation of ideas. The teacher does most of the activities in form of talking while the students are passive listeners or slightly involved. Lecture method remains one of the popular methods of teaching in Nigerian secondary schools (Kenneth (2013). He further said, most teachers of basic technology widely adopt lecture method because it provides for an effective use of time and manpower and it enables teachers to present many ideas to a large group in a relatively short period of time.

In Nigeria, at present, mostly behavioural practices are in vogue in schools where students are passive and classroom environment is mostly teacher dominated (Emaiku, 2013).The effect of teaching methods on students' performance is receiving considerable attention from educators and researchers worldwide. What students learn is greatly influenced by how they are taught (Abdulhamid, 2013). When teachers are deciding on their methods, they need to be flexible and willing to adjust their styles according to their students. Students' successes in the classroom are largely based on effective teaching methods. Faced by this variety, it is essential that the teacher knows the advantages and limitations of each method and how to use it wisely. However, According to Mohammad, (2011) it is an ineffective method that eases teaching. It is now being recognized that there are better ways of teaching than the traditional lecture

method (Akpoghol, Samba & Asemave, 2013). Therefore, the need for trying a better method images given consideration to concept mapping.

Concept Mapping is a method where the concepts in a topic are represented in maps with different shapes such as circle, box, rectangle, triangle and arrows used to show their relationship with words or phrases linking the concepts by the sides of the arrows it is a student-centred teaching method. Concept mapping-based instruction is one of the instructional strategies propounded by CEMASTER as learner-centred approach (Makoba, 2016). According to Rao (2015), concept maps are diagrammatic representations which show meaningful relationships between concepts in the form of propositions which are linked together by words, circles, and cross links. The teaching strategy presents a concept in a hierarchical organized manner.

Agwagah and Ezeugo in Awodun (2017) stated that concept-mapping method helps to make clear to both learners and teachers the small number of key ideas they must focus on for any specific learning task. Yunus cited Canas and Novak in Awodun (2017), also said that concept map tools provides a variety of features that make it possible for teachers to use concept maps for a various tasks that students perform. In educational settings, concept mapping exercises have been used to encourage students to actively construct an understanding of concepts and relationships within domains of interest (Ahmad, in Nuhu, Suleiman & Dauda, 2017).

Some studies (Arokoyu & Obunwo, 2014; Ogbonna, 2014; Okafor, Abonyi & Ugama, 2016), have opined that concept mapping strategy is a viable educational tool which can help teachers become more effective, fosters curriculum development and promotes students' hands-on activity. Although research support concept mapping as an effective method of acquiring meaningful learning, not enough steps have been taken to apply it to teaching/learning methods in classrooms.

In a quest of finding a more appropriate and effective teaching strategy that will help to develop Students interest in basic technology; which is the bed rock for technological advancement , this paper concept mapping influence on student interest in basic technology in junior secondary school in yenagoa local government area was developed.

STATEMENT OF PROBLEM

The failure rate of students in Basic Technology as revealed by the junior WEAC results from 2018 to 2020: in 2018 60% of students scored below credit in Basic Technology, in 2019 44% scored below credit and in 2020 74% scored below credit. Source: ministry of education Bayelsa State. There is a problem that needs quick attention if Bayelsa State must grow technologically. This poor academic

achievement of students could be due to their lack of interest on the subject which had emanated from the type of teaching method that was used to teach the subject.

According to Kenneth, (2013) Lecture method remains one of the popular methods of teaching in Nigerian secondary schools and that most teaches especially Basic Technology teachers use this method because it saves time and energy. This is a confirmation that most teachers of Basic technology uses lecture method which is a teacher-cantered teaching method to teach Basic Technology thereby, reducing the interest of students in the subject and resulting to poor students' academic achievement. Thus there is lack of interest in technology related course resulting in poor enrolment into technical/technology departments in higher institutions, unemployment problems and increase in crimes.

However, if Basic Technology is taught using an effective teaching method students interest in the subject and other technology related subjects will be aroused. Students academic achievement will also increase. Eze & Bot, (2014) . Learning outcome is influenced by the instructional strategy employed by teacher. It is the only factor that can easily be manoeuvre by teacher to achieve learning objectives. Hence, this paper investigates concept mapping influence on student interest in basic technology in junior secondary school in yenagoa local government area was developed.

PURPOSE OF THE STUDY

The main purpose of this study is to investigate the effect of concept mapping on student's achievement, interest and retention in basic technology in Junior Secondary Schools in Yenagoa Local Government Area, Bayelsa State.

This study sought to determine;

1. The effect of concept mapping on students' mean interest scores in basic technology in junior secondary schools in Yenagoa local government area.
2. The influence of gender on mean interest scores of student in taught basic technology using concept mapping in junior secondary schools in Yenagoa local government area.

RESEARCH QUESTIONS

The following research questions are designed to guide the study

1. What is the effect of concept mapping and lecture methods on students' mean interest scores in basic technology in Yenagoa local government area, Bayelsa State?

2. What is the influence of gender on the mean interest score of students taught Basic technology using concept mapping and those taught using lecture method in Yenagoa local government area, Bayelsa State?

NULL HYPOTHESES

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

1. There is no significant difference in the mean interest scores of students taught basic technology with concept mapping and those taught with lecture method in Yenagoa local government area, Bayelsa State.
2. There is no significant difference in the mean interest scores of male and female students taught Basic technology using concept mapping in Yenagoa local government area, Bayelsa State

METHODOLOGY

This study employed a quasi-experimental design. According to Alio in Igharo, Baridue, Opakirite & Daniel (2022) a survey research design is one in which a group of people or items are studied by collecting and analysing data from only a representative of the entire population. The target Population of the study comprised of 4502 JSS1I junior secondary school Basic technology students in public schools in Yenagoa Local Government Area of Bayelsa State (source: Ministry of Education, Bayelsa State Nigeria, 2020/2021 JSS II Enrolment)The sample size consists of 400 JSSII students. A simple random sampling was used to choose four (4) junior secondary schools out of thirty-four (34) junior secondary schools in Yenagoa Local Government Area, Bayelsa State. Out of the four (4) secondary schools, two junior secondary intact classes were randomly chosen from each of the four-secondary school with each of the intact class consisting of fifty (50) students. The two classes were assigned Group A and B.

Group A was the treatment group that was treated using concept mapping teaching method while Group B the control group, was taught using lecture method in each of the four junior secondary schools. The instrument used in this study is Basic Technology Interest Inventory Scale (BTIIS). The Basic Technology Interest Inventory Scale (BIIS) consist of 20 interest statements measured on a four point -Liker type interest rating scale developed by the researcher. This rating scale enables students indicate their level of interest thus SA=Strongly Agreed (4) A=Agreed (3), D = Disagree (2), SD = Strongly Disagreed (1).BTIIS was face and content validated by my supervisor who is an expert in the field and three different Basic Technology teachers from different schools. These instruments were subjected to Testing and Cronbach alpha formula was used to estimate the reliability of the Basic Technology Interest Inventory Scale (BTIIS), The reliability test BTIIS yielded reliability co-efficient of

0.73 which indicated that the reliability is high. Mean and Standard Deviation were used to answer the research questions while z-test was used to test the Hypotheses at 0.05 level of significance. III

ANALYSES OF DATA AND RESULTS

Performances on the three variables are presented along the research questions and hypotheses as follows:

Research Question 1: What is the effect of concept mapping and lecture methods on students' interest mean scores in basic technology in Yenagoa Local Government Area, Bayelsa State?

Table 1: Mean and Standard Deviation of Interest Scores of Students Taught Basic Technology Using Concept Mapping and those Taught using Lecture Method

Methods	Pre		Post			
	N	Mean	Mean	SD	Mean gain	
Concept Mapping	200	2.44	0.73	3.03	0.67	0.59
Lecture Method	200	2.48	0.84	2.79	0.74	0.31

Table 1 shows the mean and standard deviation of interest scores of students taught Basic Technology using concept mapping and those taught using lecture method. The students that were taught Basic Technology using concept mapping instructional strategy had mean interest score of 3.03 with a standard deviation of 0.67 at the post-test while those that were taught using lecture method had mean interest score of 2.79 with a standard deviation of 0.74. This implies that the students that were exposed to concept mapping had a higher interest in Basic Technology than their counterparts taught using lecture method.

Research Question 2: What is the influence of gender on the mean interest score of students taught Basic technology using concept mapping in Yenagoa Local Government Area, Bayelsa State?

Table 2: Mean and Standard Deviation of Interest Scores of Male and Female Students Taught Basic Technology Using Concept Mapping?

Gender	Pre-test		Post-Test			
	N	Mean	Mean	SD	Mean gain	
Male	106	2.36	0.70	2.63	0.71	0.59
Female	98	2.41	0.74	2.72	0.70	0.31

Table 2 .reveals the interest mean and standard deviation scores of male and female students taught in Basic Technology using concept mapping. It shows that male students had mean interest-test score of 2.63 with a standard deviation of 0.71 while their female counterparts had mean interest-test score of 2.72 with a standard deviation of 0.70. This has indicated that female students have higher interest in Basic Technology than their male counterparts with little difference.

HYPOTHESIS TESTING

H₀₁: There is no significant difference in the mean interest scores of students taught basic technology with concept mapping and those taught with lecture method in Yenagoa Local Government Area, Bayelsa State.

Table 3: z-test Analysis on the Interest Scores of Students Taught Basic Technology with Concept Mapping and those Taught with Lecture Method

Groups	N	Mean	S.D.	Df	z-cal	z-crit	Sig.	Rmrk
Experimental	200	3.03	0.67	398	3.355	1.96	0.001	Reject
Control	200	2.79	0.74					

Table 3 shows the z-test analysis on the interest scores of students taught basic technology with concept mapping and those taught with lecture method in basic technology concept. The analysis showed that the z-cal is 3.355, p-value is 0.001 which is less than the 0.05 level of significance i.e. ($p < 0.05$). This implies that the null hypothesis which states that there is no significant difference in the mean interest scores of students taught basic technology with concept mapping and those taught with lecture method is thus rejected.

H₀₂: There is no significant difference in the mean interest scores of male and female students taught Basic technology using concept mapping in Yenagoa Local Government Area, Bayelsa State.

Table 4: z-test Analysis on the Interest Scores of Male and Female Students Taught Basic Technology using Concept Mapping

Groups	N	Mean	S.D.	Df	z-cal	z-crit	Sig.	Rmrk
Male	106	2.63	0.71	202	0.911	1.98	0.364	Accept
Female	98	2.72	0.70					

Table 4 shows the z-test analysis on the mean interest score of male and female students taught Basic technology using concept mapping in Yenagoa Local Government Area, Bayelsa State. The analysis showed that the f-ratio is 0.911, p-value is 0.3648 which is higher than the 0.05 level of significance i.e. ($p > 0.05$), therefore the null hypothesis which states that there is no significant difference in the mean interest score of male and female students

DISCUSSION OF THE FINDINGS

Findings from the study revealed that the students taught basic technology with concept mapping instructional strategy had higher interest than their counterparts taught with the lecture method. And the further test of significance at 0.05 level shows that there is a significant difference in the main interest score of Basic Technology students taught with concept mapping and those taught with lecture method in Yenagoa Local Government Area in Bayelsa state in favour of concept mapping.

The finding of this study agrees with the report of Offor, (2011) who noted that concept mapping promotes students interest. In support of the above result, Jane and Adeola (2017) also reported that among others that students taught technical drawing using concept mapping teaching strategy had higher mean achievement and interest scores than those taught with the conventional teaching method. These results confirm what Eccles, Krzus, & Ribot (2015); Renninger and Hidi, (2015), said that Students interest is a disposition, or feeling of an individual towards an activity or an object. Hypothesis testing relating to this research question ascertains that there is significant difference in the mean interest scores of students taught basic technology with concept mapping and those taught with lecture method.

The findings of the study revealed that Female students have little higher interest in Basic Technology than their male counterparts. This difference was further tested for significance at 0.05 level and it confirms that there is no significant difference in the main interest score of male students and those of the female students taught Basic Technology using concept mapping in Yenagoa Local Government Area in Bayelsa state in favour of concept mapping.

The findings of this study contradicted the report of Ndina and Wagbara (2012), that girls had greater influence on their attitude towards chemistry than boys. This females and males have similar interest in basic technology as shown in the Hypothesis testing relating to this research question that there no significant difference in the mean interest scores of male and female students taught Basic technology using concept mapping.

CONCLUSIONS

Based on the findings and discussion of the study, the following conclusion was made; There is significant difference ($p < 0.05$) between the interests mean scores of students exposed to concept mapping method of teaching and those that were exposed to lecture method in basic technology, in favour of concept mapping instructional strategy. There is significant effect of gender ($p > 0.05$) on students' interest in basic technology, when concept mapping instructional strategy is used.

SUGGESTIONS FOR FURTHER RESEARCH

Based on the scope, findings and limitations of the study, the following suggestions for further studies are made:

1. This study should be replicated in other states of the federation using a wider geographical area (an entire state or geo-political area).
2. Replication study could be undertaken over a longer period of time than that which was available for this study.

RECOMMENDATIONS

Based on the proceeding results of this study, the following recommendations are considered appropriate

1. Basic Technology teachers should be encouraged to use concept mapping strategy to ensure effective teaching and learning as this will arouse the interest of the students. .
2. Ministry of Education should ensure that teachers are trained regularly on the use of innovative instructional strategy like concept mapping.
3. Government should encourage Basic Technology teaching and learning by providing enabling environment for the stimulation and sustenance of the learner's interest in Technology. Availability of adequate classrooms, laboratories, equipment's and facilities for the teaching of Technology will enable the teacher to effectively use concept mapping technique which has been found to enhance students' interest in the learning of Technology than the lecture method.

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