

EFFECT OF JIGSAW I MODEL ON UPPER-BASIC EIGHT STUDENTS INTEREST IN MATTER IN NASARAWA STATE, NIGERIA.

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ABSTRACT

T*his study investigated the Effect of Jigsaw I Model on Basic Eight Students' Interest in Matter in Nasarawa State, Nigeria. Three research questions and three hypotheses guided the study. The study adopted an ex-post facto design. The population consisted of 1,677 (1,000 males and 677 females) Upper basic eight Matter students. Sample size of 63 (38 males and 25 females) students were randomly selected using a simple random sampling technique. The instrument used for data collection was Students' Matter Interest Questionnaire (SMIQ) and was validated by experts. Two research questions and two null hypotheses were raised for the study. Descriptive statistics of mean rank and sum of mean rank were used to answer the research questions. Inferential statistics of Mann-Whitney U-test was the*

Introduction:

Matter formerly integrated science is a combination of Physics, Biology and Chemistry Matter is a core science subject that is offered at the Upper-basic school level. The importance of Matter cannot be over espoused. Matter helps to prepare the students for future science. One of the objectives of Matter according to Nigeria Educational Research and Development Council (NERDC, 2007) is to develop students' interest in science which will further help them to study

statistical tool used for testing the hypotheses at $p \leq 0.05$ level of significance. The finding among others reveal that: there was a significant difference between the interest level of Upper Basic eight students' taught Matter using Jigsaw I model and those taught using Lecture method in favor of the Upper Basic eight students taught using Jigsaw I model. Also, there was no significant difference between the interest level of male and female Basic eight students taught Matter using Jigsaw I Model. It was therefore recommended among others that Jigsaw I model should be used to teach students irrespective of gender.

Keywords: Influence, Teacher- Students relationship, Academic Interest, Matter Upper Basic

Science related courses and professional courses such as Medicine, Engineering, and Pharmacy among others.

A matter can be in form of gas, liquid or solid. It can also be in simple or complex form. They can be in form of element, compound and mixtures. Matter elements are basic substances that are often used to make other products (Spida works, 2022)

In spite of the importance of Matter to students' future careers, and the nation at large, student still lack interest in Basic Science. Researchers such as Tofi, Adejoh and Oche (2017a), Eriba and Samuel (2018) revealed in their works that students lack interest in Basic Science. This is also used by the work of Agu and Samuel (2018) that students lack interest in Basic Science. So lack of interest in sciences particularly has been affirmed by (Okwara, 2017). Poor foundation and instructional methods used by the science teachers has been affirmed by Achimugu (2014) and Toti, Adejoh and Oche (2017b) that most teachers employ lecture method as a method of instructions in teaching of Basic Science.

Lecture method is the one dimensional method in delivery of Science lessons in secondary schools today. Lecture method is a "Chalk and talk method is a teacher centered method. The method has the advantage of covering a wider content within short time in large span but it is not

student-centered. However, teachers have been decentralized from the use of Lecture method in teaching Matter as it causes poor students' participation (Bala, 2018). Peni (2018) stated that Lecture method is ineffective in teaching Matter because it affects students' understanding in the class and consequently students lack interest in Basic Science. Therefore, this study is focused on Jigsaw I model.

The Jigsaw I model is a teaching strategy of organizing students group work that help students collaborate and rely on one another to succeed. Jigsaw I model was originally developed by Aronson and his colleagues in 1971 (Sarah and Cassidy, 2006). Jigsaw I model breaks classes into groups and breaks the topic into pieces that the group assembles to complete the (jigsaw) puzzle. Teaching Matter with Jigsaw I model could help students develop interest in basic science. Researchers such as Egbulefu, Amaele and Sunday (2015), Ugwu and Nwagbo (2019) revealed that Jigsaw I model learning is capable of enhancing students' interest in Basic Science.

Statement of the Problem

Poor interest in Matter has been attributed to a number of factors, among which is teaching methods. The prevalent instructional strategies that Matter teachers' use for teaching in Nigerian secondary schools is the conventional lecture method to the neglect of activity - based instructional strategies. Some activity - based strategies like concept mapping, guided discovery, game instructional strategy, Scaffolding instructional strategy and Jigsaw I model have been shown to enhance interest of students in difficult science concepts. On the basis of the foregoing, the researcher explored the Effect of Jigsaw I Model on Basic Eight Students' Interest in Matter in Nasarawa State, Nigeria.

Objectives of the Study

The objectives of this study were to:

1. Determine the effect of Jigsaw I model on interest level of Basic eight students

2. Taught Basic Science. find out the effect of Jigsaw I model on interest level of male and female Basic eight students taught Basic Science.

Research Questions

The following research questions were put forward as follows:

1. What is the difference between the interest level of Basic eight students taught Matter using Jigsaw I model and those taught using Lecture method?
2. What is the difference between the interest level of male and female Basic eight students taught Matter using Jigsaw I model?

Null Hypotheses

The following null hypotheses were formulated to guide the study.

Ho₁: There is no significant difference between the interest level of basic eight students taught Matter using Jigsaw I model and those taught using lecture method

Ho₂: There significant difference between the interest level of male and female basic eight students taught Matter using Jigsaw I model.

Research Design

This study employed a quasi-experimental design of non-equivalent group involving pre test and posttest. The reason for the adoption of a Quasi-experimental design is that the researcher used intact classes for the study. The population of this study comprised of 1,677 (1000 males and 677 females) basic eight students for 2018/2019 academic session in Nasarawa State (Nasarawa State Ministry of Education, Science and Technology, 2018). Four schools were randomly selected and used for data collection, Pre-SBSIQ was given to students as pre-interest questionnaire, to determine the equivalence in academic interest level of the students in the four sampled schools. Pre-SBSIQ scores obtained were subjected to Analysis of Variance (ANOVA) statistical tool at $p < 0.05$ and the result obtained showed no significant difference. This result proved that the

groups were homogenous, hence the posttest scores were used to obtain results for generalization purpose.

Simple random sampling technique was used to select two schools out of the four schools whose scores were found homogenous. Furthermore, simple random sampling technique of male and female in Basic eight "Hat and Draw" was used to assign the schools into the experimental group and control group. The choice of this technique was to give every sampled school an equal chance of being selected. The sample size for the study 63 Basic eight students made up of 38 male and 25 female students drawn from two secondary school in Nasarawa State.

The instrument used for data collection was SMIQ. The instrument was adapted and validated by four experts, three in science education and one in Measurement and Evaluation. Recommendations arising from the validations were useful in modifying the instruments to obtain a final draft copy of SMIQ was used to determine the interest level of the students, SBSIQ is a Likert Scale which is anchored on: Strongly Agree (SA-5), Agree (A-4), Undecided (U-3), Disagree (D-2) and Strongly Disagree (SD) 1). On the other hand, the negatively worded items were however assigned values in the reverse order. The serial numbers for positively worded items were 1, 3, 6, 8, 9, 12, 16, 18, 19, 21, 23, 25, 26, 27 and 29. Conversely, items with serial numbers 2, 4, 5, 7, 10, 11, 13, 14, 15, 17, 20, 22, 24, 28 and 30 were negatively

The data collected from the school (students) during trial testing was used to determine the reliability coefficient of the instruments. The split-half method was used to establish the reliability coefficient of the Students Matter Interest Questionnaire (SMIQ) Cronbach Alpha was used to determine the reliability coefficient of SBSIQ. The reliability coefficient found was 0.85. SBSIQ (pre-SB SIQ) was administered to experimental and control groups before the commencement of the treatment. After treatment to the experimental group for a period of six weeks, the posttest (post- SBSIQ) was administered. Both the pretest (pre- SBSIQ) and posttest (post- SBSIQ) were administered by the researcher and the scores

obtained were analyzed using descriptive statistics of mean rank and sum of mean rank to answer the research questions while inferential statistics of Mann-Whitney U-test was used to test hypotheses at $p \leq 0.05$ level of significance.

Data Analysis and Result

Research question 1

What is the difference between the interest level of Basic eight students taught Matter using Jigsaw I model and those taught using Lecture method?

Table 1: Mean Rank and Sum of Mean Rank of Interest scores of Basic eight students in Experimental and Control Groups

Groups	N	Mean Rank	Sum of Mean Rank	Mean Rank Difference
Experimental Group	35	45.47	1591.5	29.86
Control Group	28	15.61	424.50	

The results in Table 1 shows that the Basic eight students taught Matter using Jigsaw I model had an interest mean rank scores of 45.47 with a sum of mean rank of 1591.50, while those taught Matter using Lecture method had an interest mean rank scores of 15.61 with a sum of mean rank of 424.50. Therefore, the difference between the interest mean rank scores of Basic eight students taught Matter using Jigsaw I model and those taught using Lecture method is 29,86. This implies that there is a difference in the interest mean rank of the two groups in favour of the Basic eight students taught using Jigsaw I model

Table 2: ANOVA summary analysis of Basic eight student's pretest interest for the four sampled schools

	Sum of square	Df	Mean Square	F	Sig
Between groups	108.374	3	36.125	201	896
Within Groups	17456.497	97	179.964		
Total	17564.871	100			

Table 2 shows that there is no significant difference in academic interest level of the students among the four sampled schools since p-value (0.67) greater than (0.05) level of significance. This result showed that the group were homogenous hence the posttest scores were used to obtain results for generalization purpose.

Research Question 2

What is the difference between the interest level of male and female Basic eight students taught Matter using Jigsaw I model?

Table 3: Mean Rank and Sum of Rank of Interest of Male and Female Basic eight Students of Experimental Group

Experimental Group	N	Mean Rank	Sum Of Mean Rank	Of Mean Rank Difference
Female	16	20.91	334.50	
				5.36
Male	19	15.55	295.50	

The results in Table 3 shows that the female Basic eight students taught Matter using Jigsaw I Model had an interest mean rank scores of 20.91 with a sum of mean rank of 334.50 while the male basic eight students taught Matter using Jigsaw I model had an interest mean rank scores of 15.55 with a sum of mean rank of 295.50 therefore, the difference between the interest mean rank scores of female and male basic eight students taught Matter using Jigsaw I model 5.36. Hence, there was a difference in the

interest mean rank scores of female and male Basic eight students. This indicates that the female Basic eight students did slightly.

H₀: There is no significant difference between the interest level of Basic eight students taught Matter using Jigsaw I model and those taught using Lecture method.

Table 4: Analysis of Mann - Whitney U - Test on The Interest of Basic eight Students of Experimental Group

Group	N	Mean Rank	Sum of mean ranks	Mann-Whitney u-test	p-value	Remark
Experimental Group	35	45.47	1591.50	18.50	0.00	Sig
Control Group	28	15.61	424.50			

Significant at $P < 0.05$

From the result of Table 4, the Mann-Whitney U-test statistics reveals that the p-value is 0.00. Therefore, p-value of 0.00 is less than the significant level of $p = 0.05$. Based on this evidence, the null hypothesis was rejected. This shows that there is significant difference between the interest scores of Basic eight students taught Matter using Jigsaw I model and those taught using Lecture method in favour of the Basic eight students taught using Jigsaw I model. This implies that Jigsaw I model significantly improved the interest of Basic eight students in Basic Science.

Table 5: Analysis of Mann-Whitney U-test of interest of male and female basic eight students of experimental Group

Experimental Group	N	Mean Rank	Sum of mean ranks	Mann-Whitney u-test	p-value	Remark
Female	19	20.91	334.50	105.50	0.12	Not sig
Male	16	15.55	295.50			

Significant at $P < 0.05$

Table 5 reveals that the calculated P-value is 0.12. Therefore, p-value of 0.12 is greater than significant value of $p < 0.05$. Based on this evidence, the null hypothesis was not rejected. This shows that there was no significant difference between the interest scores of male and female Basic eight students taught Matter using Jigsaw I model. This implies that Jigsaw I model captured alike the interest of students irrespective of gender.

Discussions

From the findings of this study, it was revealed that there was a significant difference between the interest levels of students taught Matter using Jigsaw I model and those taught using lecture method.

The sufficient change to interpret between the students in the experimental group and the control group may be due to the active nature of Jigsaw I model which impressed the students. They took interest in sharing ideas friendly in small groups. This finding confirms to the efficacy of the social constructivists view of learning in bringing about meaningful learning as it enables students construct their own knowledge, thus making them active learners rather than the passive learners just like in the Lecture method. This could have greatly enhanced the students' interest in learning Matter fact in Jigsaw I teaching model on the interest of Upper-basic secondary school students.

The findings has revealed that there was no significant difference between the interest level of male and female students taught Matter using Jigsaw I model, implying that there is no significant difference between the interest level of male and female students taught Matter using Jigsaw I model. This finding concurred with Igboamago (2014) who found that interest of male and female students was captured alike by Jigsaw I model. This means that gender disparity is not found in enhancing the interest of male and female students in Matter when Jigsaw I model is used.

This finding could be due to the gender friendly rupture of the Jigsaw I model class room. It could also attribute to the fact that their views were recognized and respected by the teachers which have boosted and enhanced their interest in learning of Matter when Jigsaw I model is employed. On the contrary the findings debunked the finding of Nwagbo and Olom (2014) who revealed that the male students showed greatest interest in Biology than their female counterpart

Conclusion and Recommendation

The condition drawn from the findings of this study was that Jigsaw I model enhanced the interest of students in Matter than those taught using Lecture method. Also student irrespective of gender should be taught using Jigsaw I model due to it efficacious influence in enhancing students' interest. Based on the findings of the study, it is recommended that Jigsaw I model should be used to teach both male and female students, as it is gender friendly.

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