EFFECTS OF JIGSAW-PUZZLE STRATEGY ON STUDENTS' ACHIEVEMENT IN JUNIOR SECONDARY SCHOOLS SOCIAL STUDIES IN NASARAWA STATE, NIGERIA

[1]Aminu, A. D., [2]Bala, S. A. & [3]Dantsoho, M. A.

[1, 2*] Department of Educational Foundations, Nasarawa State University Keffi, Nigeria
[3] Department of Art and Social Science Education, Nasarawa State University Keffi, Nigeria
Corresponding Authors Email: aminuabubakardanladi@gmail.com

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Abstract

This study examined effects of Jigsaw-Puzzle strategy on students' achievement in junior secondary schools Social studies in Nasarawa State, Nigeria. Two research questions guided the study and hypotheses were tested at 0.05 level of significance. The study employed quasi–experimental research design involving the non-equivalent pretest, posttest, control group design. The population comprised 10, 550 JS II students from 30 junior secondary schools in Nasarawa State for the 2020/2021 academic session. A sample of 120 JSS II students in two intact classes from two public secondary schools in Nasarawa Local Government Area of Nasarawa State was selected using simple random sampling technique. Data were collected using Social Studies Achievement Test (SSAT). The SSAT was validated by an expert and validity index of 0.90 was obtained. The SSAT was pilot tested on 10 students which yield 0.85 reliability index using Kuder-Richardson 21 Formula (K-R21). Mean and standard deviation was used to answer the research questions and Analysis of Covariance (ANCOVA) was used to test the hypotheses. Results revealed that the use of Jigsaw-Puzzle provided favourable effects on the jigsaw-puzzle and the effect led to significant improvement in students'- achievement in Social Studies. Similarly, the difference in the achievement mean scores of male and female students taught Social Studies using Jigsaw-Puzzle and the control group was statistically insignificant. Based on the finding of this study, it was concluded that Jigsaw was more effective in enhancing students' achievement, in Social Studies than conventional instructional method. Thus, the study recommended that Jigsaw-Puzzle should be used in the teaching of Social studies as it could help students' achievement.

Keywords: Jigsaw-puzzle, Social Studies, Students' Achievement

Introduction

Social Studies is the study of man's interaction with his environment. It exposes learners to how man influences and is being influenced by his physical, social, political, economic, psychological and cultural environment. Adeyemi and Ajibade (2011). The inclusion of Social Studies in the Junior Secondary Education curriculum exposes learners to the uniqueness and diversity of man's culture thereby inculcating in learners the ability to develop high level of acceptance of differences among people, be it socio-economic, religious, political or life style-related. The teaching of Social Studies increases the chances that students will imbibe and adhere to ethical and moral values in life. Social Studies aim at creating educated individuals who can be responsible citizens to their nation. This subject engages students in a comprehensive process of

confronting multiple dilemmas, and encourages students to speculate, think critically, and make personal and civic decisions based on information from multiple perspectives (Jacob, Joel, Sababa & Ndatuwong, 2016). The teaching of Social Studies is directed towards building a virile Nigerian nation, irrespective of ethnic diversities. The importance of Social Studies as a subject in the Nigerian school curriculum cannot be overemphasized. It is in recognition of this that the Nigerian Education Research and Development Council (NERDC, 2012) clustered Social Studies under the religion and national values subjects in the revised version of Junior Secondary Education curriculum. According to NERDC (2012), the general objectives of Social Studies include to: Develop the ability to adapt to changing environment; inculcate national consciousness and national unity; become good citizen, capable of and willing to contribute to the development of the society; and inculcate the right types of values and attitudes.

The hopes of every country of the world to develop human capital for effective functioning of the society are hinged on education, being an instrument of change. However, this can only be achieved through purposeful and qualitative education for the citizens. Despite the noble objectives of Junior Secondary Social Studies, the achievements of students at the external examination continue to decline in Nasarawa state. This is evident in the dismal academic achievement recorded in Social Studies by students' who wrote the year 2020 Basic Education Certificate Examinations (BECE) conducted by the Nasarawa State Ministry of Education, Science and Technology (NSMOEST) for JS III. According to NSMOEST (2020) out of a total of 42,557 candidates that wrote the examinations, only 8,240 candidates, representing 25.31 per cent that obtained credit pass in Social studies. The result, when compared to that of the previous two years, shows a marginal decline in the performance of candidates. For instance, in the 2018 BECE, 42.81 per cent of the candidates obtained credit pass in Social studies. In 2019, the percentage declined to 27.57 percent and further to 25.31 per cent recorded in 2020.

The poor academic achievement of JS Social studies students in Nasarawa state could be attributed to low quality of teachers' inappropriate medium of instruction used by social studies teachers. In order to address this situation, the Federal Government of Nigeria intervened in many ways. First was the reorganization of the curriculum in a way that adopted thematic approach to content organization in order to present social studies in a holistic manner to students; this will sustain the interest of the students and thereby improve their achievement in social studies. Second was the retraining of social studies teachers in all the state of Nigeria. All these efforts have not shown significant improvement in enhancing the achievement of students in social studies. The reason for the poor returns in the intervention inputs of the government and the organized private sector has been explained by the researchers as inadequate or wrong instructional strategies applied by the trainers of such human capacity development projects (Ossai, 2014). Moreover, the fact that social studies contents are learner activity-packed. involving the near-total control of the learning situation by the learner, de-emphasizes teacher's control of the teaching-learning process. Therefore, it is not all teaching strategies that lend themselves to the effective teaching and learning of social studies. Onuoha (2016) advises that teachers should evolve strategies that involve learners' active participation. Onuoha (2016) also argues that such strategies will generate greater achievement and enhance students' interest in the social studies.

Jigsaw is a cooperative learning technique and has been recorded to be successful. According to Aronson (2000), Jigsaw assigns a students to group called home group to specialize in one aspect of learning unit. Jigsaw learning allows students to be introduced to material and yet maintain a high level of personal responsibility. The purpose of Jigsaw is to develop teamwork and cooperative learning skills within all students. In addition, it helps to develop a depth of knowledge not possible if the students were to try and learn all of the materials on their own. Jigsaw learning often discloses a students' understanding of a concept as well as reveals any misunderstandings. Thus, each student is essential for the completion and full understanding of the whole concept being taught.

Group members must work together as a team to accomplish a common goal; each person depends on all the others. No student can succeed completely unless everyone works well together as a team. The jigsaw technique can enhance cooperative learning by making each student responsible for teaching some of the materials to the group. In this technique, students are members of two different groups, the "home group" and the "jigsaw group." Initially, students meet in their home groups, and each member of the home group is assigned a portion of the material to learn (Doymus, Simsek & Bayrakceken, 2004). According to Aronson (2000), the advantage of Jigsaw learning strategy is that students perform challenging and engaging tasks in their expert groups with enthusiasm since they know they are the only ones with that piece of information in their respective home groups. Before explaining to their home group, it is expected that the student will develop a clear idea of the concept (Mbacho & Changeiywo, 2013).

Gender is one of the variables considered in this study. Gender refers to the socially, culturally constructed characteristics roles which are ascribed to male and female in any society (Okeke, 2008). Afonja (2002) defines gender as a socially constructed concept based on the assumed position that a group of humans should possess. In recent past, researches in education have tried to analyse students' achievement in relation to male and female performances though inconclusive. Significant researches have indicated that gender plays a part in students' academic achievement. Studies conducted by Peter (2014) on effect of gender on students' academic achievement in secondary school social studies and revealed that gender has no significant effect on students' achievement in social studies. Likewise, Onuoha, Eneogu, Asogwa and Ngwuchukwu (2016) showed no significant difference in the mean achievement of male and female students in social studies. Moreso, Yakubu (2016) showed that the mean performance score of the experimental group was significantly higher than that of the control group. In terms of gender, findings revealed that there was no significant difference between the mean performance score of males and females when taught by using jigsaw II co-operative learning strategy. Similarly, a study by Yozza, Asdi and Rahmi (2019) indicated that the Jigsaw approach worked successfully to enhance students' learning achievement. It was also revealed that this strategy can increase students' involvement while improving teamwork and independence in the learning process and enhance student's understanding of the material being studied It is in this connection that this study determined the effects of Jigsaw-Puzzle strategy on students' achievement in junior secondary schools Social studies in Nasarawa State, Nigeria.

Statement of the Problem

One of the major problems facing social studies education in Nigeria and Nasarawa state in particular, is the low academic achievement of JS students in standardized examinations. This has posed great concern to many education stakeholders over the years. In spite of the immense benefits derivable from the introduction of Social Studies in the Junior Secondary Education curriculum, there seems to be poor handling of the subject which may have contributed to the incessant low academic achievement of students at the BECE coupled with the low quality of teachers and inappropriate instructional strategy used by the social studies teachers. This trend therefore, makes the subject seemingly difficult and makes the subject a little more complex to comprehend. Various studies have explored ways to improve in the subject including the use of instructional strategies. However, literature has revealed nothing about the use of Jigsaw-Puzzle strategy to improve achievement in Social studies in Nasarawa State. In the light of this therefore, the study on the effects of Jigsaw-Puzzle strategy on students' achievement in junior secondary schools Social studies in Nasarawa State, Nigeria was necessitated, gender is also used as a moderating variable.

Research Questions

The following research questions guided this study:

1. What are the achievement mean scores of students taught social studies with Jigsaw-

puzzle strategy and those in the conventional method?

2. What are the achievement mean scores of male and female students taught Social studies with Jigsaw-puzzle strategy?

Research Hypotheses

The following hypotheses were postulated and tested at 0.05 alpha level:

H_{O1}: There is no significant difference in the achievement mean scores of students taught social studies using Jigsaw-puzzle strategy and those taught using conventional method.

H_{O2}. There is no significant difference in the achievement mean scores of male and female students taught social studies using Jigsaw-puzzle strategy.

Methodology

The study employed quasi–experimental research design involving the non-equivalent pretest, posttest, control group design. The study population comprised 10, 550 JSS II students from 30 junior secondary schools in Nasarawa State for the 2020/2021 academic session. A sample of 120 (85 male and 35 female) JS II students in two intact classes from two randomly selected junior secondary schools in Nasarawa Local Government Area of Nasarawa State; out of 120 students sampled, 79 (54 male and 25 female) are in experimental group and 41 (31 male and 10 female) are in control group respectively. Content validity was ensured in SSAT by developing a table of specification. Face validity was obtained for SSAT by subjecting the instrument to critical appraisal of two research experts. The logical consensus of the experts gave 0.90 index of rational validity. Reliability of the instrument was established by using Kuder-Richardson formula (K-R21) method of estimating coefficient of internal consistency. The reliability coefficient of 0.85 was obtained for SSAT. Two research assistants were adequately trained for two days by the researchers on how to administer the treatment. Thereafter, SSAT was administered as pretest to JS II students by the research assistants in their respective schools and the pretest lasted for one hour. The teachers marked SSAT, the pretest scores of SSAT was collated and handed over to the researcher. Hence, the result of the pretest was used to identify two public secondary schools with similar ability in social studies out of the four public secondary schools selected. The two public secondary schools identified with similar ability in Social studies were used for the study. After the pretest, the treatment commenced on the next Social studies period by Social studies teachers in the two public secondary schools identified and the subject was offered twice a week and for a period of 40 minutes for six weeks. The SSAT items were juggled by the researcher and administered on the students as posttest immediately after the treatment. At the end of the posttest which lasted for one hour, the SSAT scripts were collected and marked by the research assistants. The scores from SSAT were collated and handed over to the researchers. The rationale for the conduct of posttest was to determine the academic achievement of the students in Social studies after treatment. The SSAT items were scored 2 marks each and the maximum mark was 80 for each of pretest, posttest and post posttest respectively. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses formulated at 0.05 alpha level.

Results

Research Question One: What are the achievement mean scores of students taught social studies with Jigsaw-puzzle strategy and those in the conventional method?

The pretest and posttest scores of students on SSAT were used to compute mean and standard deviation as shown in Table 1.

Table 1: Students' Achievement Mean Scores for Experimental and Conventional Groups

Treatment Groups	N	Pre-test		Post-test		Mean Gain
		Mean	SD	Mean	SD	
Experimental	79	13.12	8.47	24.22	10.20	11.10
Conventional group	41	12.42	9.39	15.51	11.24	3.09

From Table 1, it could be observed that the Experimental group had a pre-test mean score of

13.12 with a standard deviation of 8.47 and the post-test mean score of 24.22 with a standard deviation of 10.20. The control group had a pre-test mean score of 12.42 with a standard deviation of 9.39 and the post-test mean score of 15.51 with a standard deviation of 11.24. The mean gain 11.10 of students taught Social studies using Jigsaw-puzzle strategy is greater than the mean gain 3.09 of students in the conventional method. This indicates that students in the experimental performed better than students in the conventional group.

Hypothesis One: There is no significant difference in the achievement mean scores of students taught social studies using Jigsaw-puzzle strategy and those taught using conventional method.

To test null hypothesis one, the achievement mean scores for experimental and conventional groups from pre-test and post-test with SSAT were compared using ANCOVA and the results obtained are presented in Table 2:

Table 2: Results of ANCOVA for Students' Achievement Mean Scores in SSAT

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	10341.704[a]	4	2585.426	123.768	.000
Intercept	625.347	1	625.347	29.936	.000
Pre-test	1292.627	1	1447.279	69.283	.000
Group	1105.623	1	124.12	7.32	.000
Error	2402.263	115	19.191		
Total	318572.000	120			
Corrected Total	12743.967	119			

Table 2 shows the results of ANCOVA F (1, 115) = 7.32; P = 0.000. Since, the P-value 0.000 is less than the level of significance value 0.05, the null hypothesis was rejected. Therefore, there is a significant difference in the achievement mean scores of students taught Social studies with Jigsaw-puzzle strategy and those in the conventional method.

Research Question Two: What are the achievement mean scores of male and female students taught social studies with Jigsaw-puzzle strategy?

The pretest and posttest scores of male and female students on SSAT were used to compute mean and standard deviation as shown in Table 3.

Table 3: Male and Female Students' Achievement Mean Scores in Experimental

Treatment Groups	N	Pre-test		Post-test		Achievement Gain
Experimental		Mean	SD	Mean	SD	
Male Students	85	16.10	7.41	34.54	12.11	18.44
Female Students	35	16.42	8.49	34.51	14.20	18.09

From Table 3, it could be observed that the male student had a pre-test mean score of 16.10 with a standard deviation of 7.41 and the post-test mean score of 34.54 with a standard deviation of 12.11. The female students had a pre-test mean score of 16.42 with a standard deviation of 8.49 and the post-test mean score of 14.20 with a standard deviation of 18.09. The mean gain 18.44 for students is slightly higher than the 18.09 mean gain of their female counterparts in the experimental group. This is an indication that jigsaw-puzzle strategy has more effect on both male and female students' achievement in Social studies related concepts as their achievement are closely related.

Hypothesis Two: There is no significant difference in the achievement mean scores of male and female students taught Social studies with Jigsaw-puzzle strategy.

Table 4: Results of ANCOVA of Pre-test and Post-test Mean scores of Male and Female Students in SSAT in the Experimental

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16707.140[a]	4	879.323	5.313	.000
Intercept	45.238	1	45.238	.273	.605
Pre-test	1215.828	1	243.166	1.469	.227
Group	1101.320	1	142.21	1.469	.961
Error	5296.553	115	165.517		
Total	117808.000	120			
Corrected Total	22003.692	119			

Table 4 shows the results of ANCOVA F (1, 115) = 1.469, and P = .961. Since the P-value 0.961 is greater than the level of significance value 0.05, the null hypothesis was not rejected. This indicates that no significant difference in the achievement mean scores of male and female students taught Social studies with Jigsaw-puzzle strategy. Thus, the null hypothesis 2 which states "there is no significant difference in the achievement mean scores of male and female students taught Social studies with Jigsaw-puzzle strategy was accepted.

Discussion of Findings

The study revealed that the academic achievement of students taught Social studies using Jigsaw was significantly higher than those taught using conventional method. This concurs with the finding of Yakubu (2016) who reported that the mean performance score of the experimental group was significantly higher than that of the control group. Similarly, the result agrees with earlier findings other disciplines such as Yozza, Asdi and Rahmi (2018) who indicated that the Jigsaw approach worked successfully to enhance student's learning achievement in mathematical statistics.

Findings from this study revealed that gender does not significantly affect the achievement mean scores of students taught Social studies using Jigsaw-puzzle and those taught using conventional method. This concurs with the finding of Peter (2014) who reported that gender has no significant effect on students' achievement in Social studies. Likewise, Onuoha, Eneogu, Asogwa and Ngwuchukwu (2016) showed no significant difference in the mean achievement of male and female students in Social studies.

Conclusion

In view of the findings of this study, the following conclusions were drawn: Jigsaw-puzzle was more effective in enhancing students' achievement in social studies than conventional method. The effect of gender on students' achievement when taught social studies using Jigsaw was statistically inconsequential.

Recommendations

Based on the findings of this study, the following were recommended:

1. Teachers and students of Social studies should employ Jigsaw in the teaching and learning of Social studies. In making use of Jigsaw-puzzle, teachers are expected to make the classroom environment conducive for quality interaction among students.
2. The type of seats and their arrangement should be such that allow students to easily move around.
3. The students should take their specific materials seriously as their understanding of such will determine the quality of the expert group discussions.

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