



## Effect of Jigsaw Teaching Strategies on Social Studies Students' Academic Achievement in Delta State Secondary Schools

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### ABSTRACT

*The study investigated the effect of Jigsaw strategies on the academic performance of Social Studies students in Delta State. Two research questions and two hypotheses guided the study. A quasi-experimental, non-randomized pre-test and post-test control group design was employed. The study population consisted of 80,912 students, encompassing all Upper Basic 8 Social Studies students in Delta State. A sample size of 289 students was selected using simple random sampling. The instruments used for data collection included the Social Studies Performance Test (SSPT) and three distinct lesson plans (instructional packages). The SSPT was validated by three experts and aligned with a table of specification. The reliability of the instrument was determined, yielding a coefficient of 0.86. Descriptive statistics (mean and standard deviation) were used to address the research questions, while a t-test and analysis of covariance (ANCOVA) were employed to test the hypotheses. The findings revealed that there was a significant difference in the mean performance scores of Social Studies students taught using the Jigsaw teaching method compared to those taught using the lecture method, favoring the Jigsaw group. However, there was no significant difference in the mean performance scores between male and female Social Studies students taught using the Jigsaw method, indicating that the effect of the treatment was not gender-based. The study recommended, among other things, that Social Studies curriculum developers should integrate Jigsaw and framing strategies into the pedagogical framework of Social Studies education in Delta State, as these strategies enhance students' academic performance.*

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### INTRODUCTION

The education system of every nation serves as the cornerstone for growth and development, laying the foundation for literacy, skills, technical advancement, and the ability to utilize natural resources for the benefit of all citizens. It represents the most significant investment a country can make to rapidly improve its human, political, social, and economic resources. Both developed and developing societies, regardless of their complexity, have long utilized education as a key instrument for achieving desirable social, economic, political,

and technological transformation. This global trend has shaped the educational philosophies of numerous countries, including Nigeria.

Despite its importance, Social Studies in Nigeria has been plagued by consistently unsatisfactory student performance in both internal and external examinations. A critical factor contributing to this trend is the ineffective instructional methods employed by teachers. Many Social Studies teachers predominantly rely on the lecture method, which often leads to rote learning, where students memorize concepts without fully understanding them. This method,

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characterized by passive listening, note-taking, and memorization, has remained a dominant strategy for decades, but it fails to produce the desired learning outcomes. Consequently, student performance in Social Studies continues to lag.

To address this issue, teaching methods must shift toward activity-oriented strategies such as demonstrations, projects, field trips, jigsaws, and metacognitive strategies. This study aims to examine the effectiveness of the Jigsaw teaching strategy (JTS) and framing methods in improving Social Studies instruction.

### The Jigsaw Teaching Strategy

The Jigsaw teaching strategy, introduced by social psychologist Elliot Aronson in 1971, is a cooperative learning method designed to foster collaboration among students. It involves dividing a class into small groups, where each group works on a specific segment of the material. Students within each group are tasked with mastering their assigned portion and then teaching it to their peers, effectively making them both learners and instructors.

Based on Adam's framework, in a typical classroom of 26 to 33 students, groups of four to six members are formed heterogeneously, considering factors such as prior performance, race, sex, language, and background. Students first collaborate within their groups and then join "expert groups" to delve deeper into their specific topics. They return to their original groups to share their expertise and contribute to the collective learning process. This approach promotes language development, social skills, and improved performance, particularly among low-ability students, by facilitating interaction with peers of varying abilities.

Research supports the effectiveness of the Jigsaw strategy in improving student outcomes. For example, Ojekwu (2020) reported higher academic achievement in Biology when using the Jigsaw strategy. This study seeks to determine whether the Jigsaw strategy can enhance students' performance in Social Studies. By fostering self-regulation and encouraging learners to take responsibility for their education,

this approach could offer a transformative method for teaching the subject. Additionally, this research will examine the influence of gender on student performance, providing valuable insights into effective instructional strategies.

### Problem of the Study

Despite the critical role of Social Studies in fostering nation-building and citizenship development, students' performance in the subject has consistently fallen below expectations. An analysis of Basic Education Certificate Examination results from 2024 to 2023 in Delta State reveals persistently poor performance. In stance, the persistent poor performance of secondary school students in Social Studies raises concerns about the effectiveness of the teaching methods employed by teachers. Data obtained from the Delta State Ministry of Basic and Secondary Education in Asaba reveals a troubling trend: during the 2016–2017 academic session, only 50% of candidates who sat for the Basic Certificate Examination (BCE) passed Social Studies. This percentage dropped to 46% in 2017–2018 and further declined to 45% in 2018–2019, before slightly increasing to 51% in 2019–2020. This pattern reflects an overall average that highlights the need for a critical review of instructional strategies in the subject. To address this challenge, this study is designed to investigate effect on jigsaw on academic achievement in Social Studies among up basic education students in Delta State.

Therefore, the purpose of this study to examine the effect of jigsaw teaching strategies on social studies students' academic achievement in Delta State secondary schools.

### Research Questions

1. What is the difference in the mean performance score between Social Studies students taught with Jigsaw and framing teaching methods?
2. What is the difference in the mean performance score between male and female Social Studies students taught with the Jigsaw teaching strategy



## Hypothesis

1. There is no significant difference in the mean performance score between Social Studies students taught with Jigsaw and those taught with Lecture teaching method.
2. There is no significant difference in the mean performance score between male and female Social Studies students taught with the Jigsaw teaching strategy

## LITERATURE REVIEW

### Concept of Academic Performance

Academic performance traditionally refers to a student's achievement, often measured through standardized tests, classroom assessments, and course grades, culminating in a Grade Point Average (GPA). However, the adequacy of these measures is debated, as critics highlight their inability to capture critical thinking, creativity, problem-solving skills, teaching methods, teacher effectiveness, gender differences, parental involvement, and environmental influences.

York et al. (2015) expand on this by emphasizing the significance of understanding academic discourse and contextual issues, advocating for a more comprehensive evaluation approach. Academic performance reflects the extent to which students achieve their learning objectives, encompassing the knowledge, skills, and competencies gained through instruction. It serves as a key indicator of the success of educational programs globally. Narad and Abdullahi (2016) describe academic performance as the total knowledge a student possesses, commonly evaluated through tests and examinations.. Sharma (2019) further emphasizes its role in assessing the effectiveness of educational institutions.

This broad perspective on academic performance recognizes its multidimensional nature, incorporating various student abilities and external influences to provide a more holistic understanding of educational success.

### Concept of Jigsaw Instructional Strategy

The Jigsaw strategy is a cooperative learning method that fosters interdependence

among students by organizing classroom activities into collaborative tasks. Developed by social psychologist Elliot Aronson in 1971 to reduce racial cliques in desegregated schools and later adapted by Robert Slavin, the strategy divides students into groups of five or six and assigns each member a specific portion of the material to learn.

Students first form expert groups, where members studying the same topic meet to deepen their understanding. They then return to their home groups to teach their peers what they've learned. Following group discussions, students take individual quizzes to assess their understanding. This process ensures that all group members contribute to and benefit from shared knowledge.

For example, a classroom assignment may be divided into distinct topics. Each group member learns about their assigned topic individually and presents it to their home group. Students then join topic groups, where members with the same topic reconcile differing viewpoints and synthesize information to create a report. These reports are later shared within the original home groups, providing a comprehensive understanding of all topics.

According to Patterson (2023), the Jigsaw strategy promotes collaboration by encouraging students to share ideas, seek additional information, and make collective decisions. It also enables teachers to use alternative assessment methods, reducing reliance on competitive exams. Johnson (2017) found that the Jigsaw method fosters positive attitudes toward learning compared to competitive or individualistic approaches.

A key element of the Jigsaw strategy is positive interdependence, where students recognize that their success depends on the group's success. This dynamic encourages collaboration, as students are motivated to support one another in achieving collective goals. By fostering mutual accountability and shared learning, the Jigsaw strategy enhances engagement, understanding, and retention in the classroom.



### Procedures for Jigsaw Instructional Strategy

The following procedures should be followed in a Jigsaw classroom for administering a lesson according to Hasan et al(2020):

- a) Introduce the technique and the topic to be studied by giving a brief explanation of the technique to the students and summarizing the topic.
- b) Randomly assign each student to a home group of 3-5 depending on the class size and ensure that the group is diverse in terms of gender, ethnicity, race, and ability.
- c) Divide the day's lesson into segments and assign one segment to each student in the home group.
- d) Provide materials and resources necessary for all students to learn about their topic and become experts.
- e) Give students time to read over their segment at least twice and become familiar with it.
- f) Create a temporary "expert group" that consists of students across the "home group" who will read the same segment.
- g) Discuss the rules for reconvening into a "home group" and provide guidelines as each "expert" reports the information learned.
- h) Give students in the expert group time to discuss the main points of their segment and to rehearse the presentation they will make to their home group.
- i) Bring students back into their home groups.
- j) Ask each student to present his or her segment to the home group. Encourage others in the home group to ask questions for clarification.

### Gender and Students' Academic Performance in Social Studies

Gender refers to social attributes and roles associated with being male or female. Azikiwe (2001) defined gender as social and historical constructs for masculine and feminine roles, behaviors, attributes, and ideologies linked to biological sex. Lee (2019) described gender as a socially ascribed attribute differentiating femininity from masculinity. Risman (2018) emphasized gender as socially and culturally constructed expectations and obligations shaping

male-female relations. Variations in gender are believed to influence students' academic performance in schools.

The influence of gender on students' academic performance has been a subject of debate. Laschever and Babcock (2021) noted that gender dynamics in education have been a persistent concern. Despite efforts toward gender equality, disparities in academic performance between males and females persist. Ekwueme and Nenty (2019) reported that boys perform better in mathematical tasks, while girls excel in clerical tasks. Harbor-Peters (2019) observed boys outperforming girls in mathematics, especially before age 11.

Contradictions exist in the literature regarding gender and academic performance. Ammermueller and Dolton (2017) highlighted a historical gap favoring girls in reading, English, and the arts, with recent improvements in girls' performance in Social Studies. Ontiveros-Arrieta (2022) confirmed significant gender differences in Social Studies, noting that boys more frequently aspire to Social Studies-oriented careers. Mwihi (2020) found that gender influences Social Studies performance, while Magdefrau (2023) observed boys' greater participation in Social Studies discussions and activities. These findings reveal inconsistencies, necessitating further investigation to address the gender-performance debate.

In Nigeria, studies reveal that male students often outperform females in Social Science subjects (Ogunsola-Bande, 2020; Akanbi, 2015). Research indicates proportionally lower female performance in Social Science education and careers (Ogunsola-Bande, 2020a). Researchers such as Abaidoo (2018)) found boys excelling in science, technology, and mathematics.

Efforts to address gender disparities include promoting equal opportunities in education. Okeke (2017) examined the effect of gender on Social Studies performance using a quasi-experimental design. The study involved 180 upper basic students in Delta and Edo States. Results showed no significant effect of gender on



Social Studies performance but highlighted an interaction between treatment and gender.

Gender differences in performance are influenced by socio-cultural factors. Emphasizing the importance of considering instructional strategies in relation to gender, Dania (2014) noted traditional norms encouraging conformity in girls and active roles in boys. Spencer (2017) pointed out the structured nature of girls' games. This study aims to resolve inconsistencies in the literature on gender differences in Social Studies performance, focusing on instructional strategies and their interaction with gender.

### EMPIRICAL STUDIES

Mwihia (2020) carried out a study on the effect of the Jigsaw instructional strategy on students' performance in HIV/AIDS content in biology in the Otta education zone of Ogun State. Using a quasi-experimental research design, the study involved two experimental groups and two control groups, with a sample of 220 students. Data were collected using a biology performance test (BAT) and analyzed with mean, standard deviation, and analysis of variance (ANOVA). The experimental groups received treatment with the Jigsaw strategy, while the control groups did not. Results showed a significant positive effect of the Jigsaw strategy on students' performance. The study recommended that biology teachers adopt the Jigsaw instructional strategy for teaching HIV/AIDS content.

Oghene (2015) examined the effect of the Jigsaw instructional strategy on students' interest in HIV/AIDS content in biology in the Agbor education zone of Delta State. A quasi-experimental design was adopted, with two experimental groups and two control groups comprising 200 senior secondary school students. Data were collected using a biology performance test (BAT) and a biology interest scale, and analyzed using mean, standard deviation, and ANOVA. The findings revealed that the Jigsaw strategy significantly enhanced students' interest. The study recommended the use of cooperative learning methods, such as the Jigsaw strategy, in teaching biology. This study relates to the present study by focusing on the Jigsaw strategy, though

it centered on biology, whereas the present study focuses on Social Studies, which is often perceived as more abstract.

Nwankwo and Okigbo (2021) investigated the effect of the Jigsaw instructional strategy on students' interest in some concepts in chemistry in Anambra State. The quasi-experimental study involved two experimental groups and two control groups, with a sample of 320 senior secondary school students. Data collected using a chemistry interest scale were analyzed with mean, standard deviation, and ANOVA. Results showed a significant positive effect of the Jigsaw strategy on students' interest in chemistry. The study recommended its adoption in chemistry teaching. While this study dealt with chemistry, the present study focuses on Social Studies.

Maxwell (2018) studied the effect of the Jigsaw instructional strategy on students' performance in Government in the Etche education zone of Rivers State. The quasi-experimental study involved two experimental groups and two control groups, with 180 Government students. A government performance test (GAT) was used for data collection. Results showed a significant positive effect of the Jigsaw strategy on students' performance. The study recommended its use in teaching Government.

Ojekwu (2019) examined the effect of the Jigsaw instructional strategy on students' performance in biology in Eleme Local Government Area, Rivers State. The pretest-posttest quasi-experimental study involved one experimental group and one control group, with 92 biology students. Data were analyzed using mean, standard deviation, and ANOVA. Findings revealed that the Jigsaw strategy significantly improved students' performance in biology. The study recommended its regular use in teaching biology content.

Nwankwo and Okigbo (2021) conducted another study on the effect of the Jigsaw instructional strategy on students' performance in chemistry in Anambra State. The quasi-experimental study involved two experimental groups and two control groups, with a sample of





270 students. Results showed no significant effect of the Jigsaw strategy on students' performance. The study recommended that teachers select instructional strategies best suited for their subject matter. This study relates to the present study as it highlights varying results regarding the effectiveness of the Jigsaw strategy.

Iweka (2019) investigated the effects of the Jigsaw and personalized teaching methods on students' performance and interest in biology. Findings showed that both methods were effective, with the personalized method proving superior. This study suggests that the effectiveness of teaching strategies may vary depending on the subject.

Binabo (2018) explored the effect of the Jigsaw instructional strategy on students' interest in geometry in mathematics in Rivers State. The quasi-experimental study, involving 280 students, found that the Jigsaw strategy significantly improved students' interest. The study recommended its use in teaching mathematics. Based on the studies reviewed, the effectiveness of the Jigsaw instructional strategy appears inconclusive, varying across subjects and contexts. This underscores the need for the present study to evaluate its application in Social Studies, a subject often perceived as abstract, to clarify its impact and address existing gaps in research.

## METHOD AND PROCEDURE

This study employed the quasi-experimental non-randomized pretest-posttest control group design. There was no randomization of subjects in this study. Intact classes will be randomly assigned to the experimental and control groups. It is a quasi-experimental study because non-randomized intact classes were used for the study. The independent variables are the Instructional methods (Jigsaw, framing, and lecture) while the dependent variable is the performance score of the students.

The target population for the study comprised all the Upper Basic 8 Social Studies students in Delta State, consisting of 80,912 students for the 2021/2022 academic session from 453 public upper basic schools (Source:

Ministry of Basic Education, Asaba, 2024). These schools are geographically located across the three senatorial districts of Delta State: Delta North with 168 public secondary schools, Delta Central 187 and Delta South 116 public secondary schools. Number of schools in each local government area will be in the appendix II. Upper Basic 8 students were chosen because the Upper Basic 7 students are fresh therefore will not be mature enough to understand the concepts that will be taught and may not be serious enough to take part in the experiment. The Upper Basic 9 students will be very busy preparing for their Basic Certificate Examinations, on this wise they will not be able to take part in the quasi-experimentation. Hence Upper Basic 8 Social Studies students were chosen for the study because they are mature and are not preparing for any external examinations.

The sample size for this study is two hundred and eighty-nine (289) upper basic 8 Social Studies students, selected from six (6) mixed secondary schools in Delta State. The six (6) schools for the study were selected using purposive sampling techniques. In this technique, the schools were first grouped into local government areas. Then six (6) local government areas were randomly selected using simple random sampling. In the six (6) selected from the three senatorial districts, The sample size of this study is six upper basic 8 secondary schools, two each from the three senatorial districts in Delta State; six intact classes of upper basic 8 secondary students from the six chosen schools; two hundred and eighty-nine (289) upper basic 8 Social Studies students; and six research assistants from the six selected public schools.

The study employed purposive and random sampling techniques for all stages of selection. Purposive sampling was used in selecting six secondary schools, two each from the three senatorial districts, across the twenty-five local government areas in the state. Purposive sampling was used since it is a deliberate effort to ensure that two schools are chosen from each of the three senatorial districts of the state.

Social Studies Performance Test (SSPT) and three different lesson plans

(Instructional package) will be used as instruments in the study. The research instrument is the Social Studies Performance Test. The Social Studies Performance Test (SSPT) was developed by the selection and compilation of test items on the topics of Family, Concept of Marriage, and Readiness in Marriage drawn from 2019- 2021 question papers. The three different lesson plans (instructional packages) are comprehensive lesson plans drawn from both first and second-term schemes of work topics for upper basic 8 Social Studies taught using Jigsaw, Framing, and Lecture methods respectively for six (6) weeks. The Social Studies Performance Test (SSPT) is a 50-item multiple-choice Social Studies Performance Test (SSPT).

Before the commencement of the experiment, a 50-item multiple choice Social Studies performance test was constructed by the researcher. To determine the face validity of the instrument, the SSPT was given to three experts in Social Science Education, one expert in Test and Measurement, and two Social Studies teachers in secondary school with experience. They were asked to comment on the suitability of the questions in terms of language level and cognitive domain assessment, the face validity of the instrument was considered adequate by expert judgment. The content validity of the SSPT instrument was established via the table of specifications shown in Table 3 below.

The reliability of the instrument (SSPT) was established by using Kuder-Richardson's formula - 21 (K-R 21) the rationale behind the adoption of this approach is that it is more

appropriate for multiple choice objective test items that were scored dichotomously (correct or wrong, pass or fail, all or non). The SSPT was pilot-tested using two schools (Urhuoka Secondary School, and Okurekpo Secondary School) in Ethiopie East Local Government Area of Delta State, which have similar characteristics as the sampled schools. The test reliability coefficient was calculated using the Kuder – Richardson formula 21 (KR-21). This formula was chosen because it combines convenience in calculation with satisfactory accuracy of estimation. When the KR-21 formula was used, the calculation yielded a reliability coefficient ( $r$ ) of 0.86. According to Fraenkel and Wallen (2019), a KR-21 value of 0.7 and above is considered suitable for making group inferences that are accurate enough. (See Appendix IV for computation).

The study adopted descriptive statistics as a method of data analysis to answer the research questions, while hypothesis was tested with t-test statistical analysis and Analysis of Covariance (ANCOVA).

## PRESENTATION OF RESULTS AND DISCUSSION

The results are tabulated and interpreted immediately after each table according to the research question and corresponding hypothesis.

**Research Question One:** What is the difference in the mean performance score between Social Studies students taught with Jigsaw and framing teaching methods?

**Table 1:** Mean and Standard Deviation of Pretest and Posttest Performance Scores among Social Studies Students Taught Using Jigsaw and Framing

Group	N	Pretest		Post-test		Mean Difference
		Mean	SD	Mean	SD	
Jigsaw	99	22.98	4.23	67.39	9.56	44.41
Lecture	97	22.48	4.76	64.66	7.19	42.18
Total	196					

The data in Table 1 shows pretest mean achievement scores of 22.98 and 22.48 for Social Studies students taught using jigsaw and Lecture. This implies that all the groups were equivalent in

the knowledge of the Social Studies concepts taught before treatment by mere comparison of the means. For the posttest, jigsaw obtained a higher mean performance score of 67.39, with a

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standard deviation of 9.56, while f Lecture had a mean performance score of 64.66, with a standard deviation of 7.19, Table 1 showed that Social Studies students taught with jigsaw scored the highest marks.

**Hypothesis one:** There is no significant difference in the mean performance score between Social Studies students taught with Jigsaw and those taught with Lecture teaching method.

**Table 2:** t-test Comparison of Posttest Mean performance Scores of Social Studies Students Taught Using Jigsaw and Lecture teaching method

Group	N	$\bar{x}$	SD	DF	t-cal.	Sig. (2-tailed)	Decision
Jigsaw	99	67.39	9.56	195	2.196	0.030	Significant
Lecture	97	64.66	7.19				
Total	196						

P<0.05

The data in Table 2 shows that there is a significant difference between the mean performance scores of Social Studies students taught using jigsaw and framing teaching methods,  $t = 2.196$ ,  $P(0.030) < 0.05$ . Thus, the null hypothesis is rejected. This implies that there is a significant difference between the mean performance scores of Social Studies students

taught using the jigsaw and Lecture teaching method, in favor of jigsaw students.

**Research Question 2:** What is the difference in the mean performance score between male and female Social Studies students taught with the Jigsaw teaching strategy?

**Table 3:** Mean and Standard Deviation of Posttest performance Scores of Male and Female Social Studies Students Taught Using the Jigsaw Teaching method

Sex	N	Post-test Mean	SD	Mean Difference
Male	56	68.50	9.88	2.55
Female	43	65.95	9.02	
Total	99			

In table 3, the male student's posttest mean achievement score is 68.50, with a standard deviation of 9.88, and the female students had a posttest mean achievement score of 65.95, with a standard deviation of 9.02. The overall mean difference between the sexes is 2.55, in favor of male students. This showed that the male students scored higher than their female

counterparts in Social Studies when they were exposed to the Jigsaw teaching method.

**Hypothesis 2:** There is no significant difference in the mean performance score between male and female Social Studies students taught with the Jigsaw teaching strategy

**Table 4:** t-test Comparison of Posttest Mean Performance Scores of Male and Female Social Studies Students Taught Using the Jigsaw Teaching method

Sex	N	$\bar{x}$	SD	DF	t-cal.	Sig. (2-tailed)	Decision
Male	56	68.50	9.88	97	1.319	0.190	Not Significant
Female	43	65.95	9.02				
Total	99						

P>0.05

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The data in Table 4 shows that there is no significant difference between the mean performance scores of male and female Social Studies students taught the jigsaw teaching method,  $T = 1.319$ ,  $P(0.190) > 0.05$ . Thus, the null hypothesis was retained. This implies that there is no significant difference between the mean performance scores of male and female Social Studies students taught the jigsaw teaching method. The treatment using the jigsaw teaching method is not sex-biased.

### DISCUSSION OF FINDINGS

The study showed that there is a significant difference in the mean performance scores among Social Studies students taught with the jigsaw, and lecture method, in favor of the jigsaw teaching strategy. The jigsaw teaching strategy proved more effective than the lecture. The difference in the mean performance scores among the three groups may be a result of the different teaching methods adopted in each group. The teaching methods adopted may have enhanced students' comprehension of learned Social Studies concepts more than the other. Social Studies students taught with Jigsaw and outscored those taught with the lecture method. This suggests that students in Jigsaw teaching may have been more active during the teaching and learning process which contributed to the higher performance scores. The low-performance scores of students in the lecture group are a result of the passive involvement of students during the teaching and learning process since teachers pass their knowledge to students. This finding supports that *Mwihia* (2020) conducted a study on the effect of the Jigsaw instructional strategy on students' performance in HIV/AIDS content in biology. The result of the study showed that the Jigsaw instructional strategy has a significant effect on students' performance in HIV/AIDS content in senior secondary school biology.

This finding also agrees with the views of *Ede* (2018) who conducted a study on the effect of Jigsaw instructional strategy on students' interest in some concepts in Physics. The study was conducted in Rivers State. The major finding of the study was that the Jigsaw instructional

strategy has a significant effect on students' interest in Physics. This finding also agrees with that of *Maxwell* (2018) who carried out a study on the effect of Jigsaw instructional strategy on students' performance in Government. The study was conducted in Etche education zone of Rivers State. The major finding of the study showed that Jigsaw instructional strategy has significant difference on students' performance in senior secondary school Government. The study recommended the use of the Jigsaw instructional strategy in learning senior secondary school Government in Etche education of Rivers State. In another development, the findings of this study disagree with the work of *Ogwo* (2019) who conducted a study on the effect of Jigsaw instructional strategy on students' performance in Chemistry. The study was conducted in the Okigwe education zone of Imo State. The result of the study showed that Jigsaw instructional strategy has no significant effect on students' performance in Chemistry. However, *Iweka*, (2019) investigated the effects of the jigsaw and personalized systems of teaching biology on student's performance and interest. Analysis from the biology interest scale indicates that personalized systems had a significant effect in improving students' performance and interest in biology. Both jigsaw and personalized systems are among the innovative methods considered effective for teaching. The superiority of the personalized system over the jigsaw strategy may be that the personalized system is better for teaching because different subjects have different approaches to presenting instructions to affect effective learning.

Similarly, the study agrees with the findings *Pokhrel*, K., *Teron*, R., & *Debnath*, M. (2023). and examine the effects of framing instructional strategy on students' performance and retention of knowledge in the mole concept. Results showed that framing instructional strategy was superior to the lecture method in enhancing students' performance and retention of knowledge in mole concepts. In the same vein, the findings from this study also concurred with the work of *Igwe* (2015) who determined the effect of concept mapping and framing instructional strategies on

students' attainment of selected chemistry topics. Results revealed that there were significant main effects of treatment on the dependent measures which included cognitive performance in chemistry performance. The combined strategy obtained the highest adjusted post-test mean score for cognitive performance, followed by the concept mapping, then the framing strategy, and last the conventional teaching method. The finding also corroborates the work of Sor, et al, (2018) when they investigated the effects of metacognitive strategies of concept mapping and framing singly and in combination on students' attainment of some chemical thermodynamics concepts perceived as difficult to learn. Results showed that there were significant main effects of treatment on students' concept attainment at the classificatory, formal, and use-of-concept levels of attainment.

The result of the study showed that there is no significant interaction between teaching methods jigsaw, and sex on students' performance in Social Studies. This finding agrees with that of Al-Tamimi, et al. (2020) who found that there was not a meaningful interaction between gender and different levels of language proficiency for a better development of speaking ability under task-based teaching. This finding agrees with the views of Banerjee and Kumar (2014) who reported a non-significant effect of interaction between sex and teaching method on students' achievement in science. However, this finding disagrees with that of Kenni (2020) who reported a significant interaction effect between gender and framing on students' achievement in Mathematics.

This finding contradicts that of Nwafor, et al. (2023) who reported a significant interaction effect of treatment (problem-based teaching) and gender on performance in Chemistry. This finding disagrees with that of Li et al. (2022) who found a non-significant effect of interaction between sex and teaching method on students' performance towards reading comprehension.

## CONCLUSION

Based on the findings, the following conclusions were drawn:

1. Social Studies students taught using jigsaw performed better than Social Studies students taught using lecture teaching method

2. Male and female social studies students taught jigsaw teaching method have similar mean performance scores

## RECOMMENDATIONS

1. A comprehensive specialized training program for social studies teachers should be organized by the Ministry of Education to enhance proficiency in utilizing jigsaw and framing, strategies in Delta State, focusing on the effects and implementation of jigsaw and framing teaching strategies. This can empower teachers to integrate these methods seamlessly into their instructional strategies.
2. Social studies teachers should adopt a flexible teaching approach like jigsaw in social studies education in Delta State. Acknowledging the significant differences in mean performance scores between the jigsaw and lecture methods.
3. The Ministry of Education should organize seminars, workshops, and conferences for social studies educators, focusing on how to deploy framing teaching strategies in schools in teaching social studies.

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