



Effects of Reciprocal and Problem-Solving Instructional Strategies on Students' interest in Senior Secondary School Economics in Wukari Education Zone, Taraba State

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Abstract

The study examined the impact of reciprocal and problem-solving instructional strategies on the Interest of Senior Secondary School II (SS II) Economics students in Nigeria. The research involved 92 students from four intact classes and used a quasi-experimental, 2x2 factorial pre-test, post-test design. Data were collected using the Economics Interest Scale (EIS) which was validated and found reliable. Descriptive statistics and Analysis of Covariance (ANCOVA) were used for data analysis. The results showed no significant difference in the mean Economics Interest scores between students taught Economics using reciprocal and problem-solving strategies, although problem-solving students performed slightly better. There was no significant difference in mean Economics Interest scores between male and female students, despite females showing a slightly higher mean gain. No significant interaction effect was found between gender and instructional strategies on students' interest. The study concluded that both reciprocal and problem-solving instructional strategies are effective in enhancing students' Interest in Economics, and that gender does not significantly influence achievement or reaction to these strategies.

Keywords: Method of Teaching, Reciprocal, Problem-Solving Instructional Strategies, Students' interest in Economics.

Introduction

Economics in senior secondary schools is crucial for understanding economic principles and participating in economic activities. However, conventional teaching methods, such as lecturing and rote memorization, may not engage students or cater to diverse learning styles. There is a need for innovative and engaging instructional strategies in Economics classrooms. Reciprocal teaching and problem-solving strategies have shown promise in other disciplines, fostering deeper understanding and engagement. Interest in Economics is essential for motivation and learning outcomes. Understanding the impact of instructional strategies on gender differences in interest levels is crucial for promoting equitable teaching practices. This study aims to examine the effects of reciprocal and problem-solving strategies on students' interest in senior secondary school Economics in Wukari Education Zone, Taraba State, to inform pedagogical practices and contribute to a more positive learning environment for Economics students.

Reciprocal teaching approach is one of the instructional methods which cover the necessary strategies: predicting, generating questions, clarifying, and summarizing. It helps students improve their understanding of scientific concept and thus enhancing performance. Ode and Uchenna (2018) postulated that the strategy allows both the teachers and students share the role of the teacher by allowing the students lead the discussion at any instructional stage. The aim of reciprocal teaching is to use discussion to improve students' comprehension, develop self-regulatory and monitoring skills, and achieve overall improvement in motivation (Mohammed, & Abbas, 2012).

Problem-Solving theory and practice suggest that thinking is more crucial than knowledge in solving problems, and thinking can be taught even with limited prior knowledge (Boris 2020). Problem-Solving strategy is defined as a process of organizing cognitive and effective behavioral processes towards a specific goal, closely linked to creativity (Elif 2018). Awodun (2020) states that Problem-Solving is knowing what to do when one doesn't know what to do, implying a step-by-step approach to resolution. It is an investigative process where the solution is not immediately apparent. Generally, Problem-Solving involves defining the problem, gathering relevant information, reasoning through solution states, and evaluating the outcome. Awodun (2020) also defines it as an individual's use of prior knowledge, skills, and understanding to address unfamiliar situations. According to Prevost and Lemons (2016), problem-solving is a decision-making process where students face challenging, non-automatic tasks requiring high-level skills. The aim of problem-solving teaching is to create an environment for student interaction and independent problem-solving with teacher or peer guidance (Nozari & Siamian 2014).

Operationally, problem-solving instructional strategy is a teaching method where students apply existing knowledge to bridge gaps or find solutions to current problems with teacher or peer support. The problem solver independently thinks through solutions, receiving hints or suggestions from the teacher as needed. Students must synthesize and apply learned material to new situations. A problem arises when an individual faces something unfamiliar or lacks an applicable model. Adegoke (2017) posits that Problem-Solving skills are learned, not inherited, requiring conscious effort. Seven steps for effective problem-solving include: identifying the problem, defining goals, brainstorming, assessing alternatives, choosing a solution, active execution, and evaluation (Awodun 2020). Given the nature of Economics in Secondary Schools, participatory and engaging instructional strategies are necessary. This study will investigate the effects of reciprocal and problem-solving instructional strategies on students' academic achievement in secondary school Economics to determine their effectiveness.

Interest is the degree of liking or disliking towards a subject, event, or object, influencing reactions (Odo 2015). Adam (in Ezeudu, Samson, & Okafor 2017) defines interest as attention. It drives students to exert effort for better performance (Adeleye 2011; Okoro 2013). When students are interested, they are more engaged, whereas a lack of interest leads to boredom (Ezegbe, Ikwumelu & Okeke 2012). Interest enhances the desire to study and affects achievement (Odo 2015). Operationally, interest in Economics is a state of curiosity and concern towards relevant materials, leading to active participation. However, effective knowledge transfer in senior secondary school Economics may depend on participatory instructional strategies and factors like student gender (Chiu & Chow 2015; Olasehinde & Olatoye 2014).

Despite the benefits of studying Economics, students' academic achievement and interest have been declining (WAEC 2019, 2020, 2021 & 2022). Poor graphical analysis, incorrect terminology, and insufficient explanation are cited as contributing factors. Researchers like Idika, Onuoha, Nji, and Eze (2018) attribute poor achievement to teachers' inadequate subject knowledge. Ede (2016) lists mathematical phobia, unqualified teachers, poor motivation, inadequate resources, gender, and distractions as other factors. Oleahbiele and Chukwu (2019) recommend innovative teaching strategies over the persistent use of conventional methods. WAEC Chief Examiners' Reports (2022) also point to shallow knowledge, wrong terminology, poor graphical analysis, inability to explain points, and incorrect interpretation of questions as general causes of poor performance in WASSCE, with instructional strategies being a key factor in Economics specifically. Lack of mathematical skills, deficiencies in graphical representation, incorrect terminology, and inadequate preparation are also noted. Inuwa and Yusuf (2012) link low academic achievement to teachers' failure to use innovative strategies. Low pass rates in Economics in Wukari education zone (WAEC reports between 2019 and 2022) may contribute to low student interest, which participatory instructional strategies could potentially arouse.

Gender is a moderating variable in this study to determine its effect on students' interest in Economics when reciprocal and problem-solving strategies are used. Lips (2017) defines gender as role behaviors in thinking, actions, and feelings. Russell (2012) sees it as different roles, rights, and responsibilities. Onah (in Uchechukwu and Oluikpe 2017) notes that gender extends beyond biological differences to societal expectations. Woolfolk (2013) defines it as culturally appropriate traits for men and women. In this study, gender refers to the biological differences between male and female students and their behaviors towards educational activities. Given observed differences in achievement patterns (Weis et al 2013), with males often performing better in math and science (Olasehinde & Olatoye 2014) and females in arts and language (Chiu & Chow 2015), while some research shows no significant gender effect with certain instructional strategies (Titus, Dada & Adu 2016; Falode et al 2016; Odinko and Arikpo 2015), this study aims to address these controversies regarding interest and gender in the context of appropriate instructional strategies for teaching Economics.

Theoretical Framework

Social cognitive development theory (Vygotsky, 1934)

This theory was propounded by Vygotsky in 1934. The theory stressed the fundamental role of social interaction in the development of cognition. This is because it strongly believes that community plays a central role in the process of making meanings. Vygotsky's theory is based on the presupposition that learners should be actively involved in the processes of thinking. There are three major principles underlying Vygotsky's theory. First, social interaction plays a

critical role in cognitive development in relation to what is learned and when and how learning occurs. This principle asserts that “without the learning that occurs as a result of social interaction, within self-awareness or use of signs and symbols that allow us to think in more complex ways we would remain slaves to the situation, responding directly to the environment. The second principle is associated with the idea that the potentials for the cognitive development is limited to a certain time span. Finally, the only way to understand how humans come to know is to study/learn in environment where the process of learning rather than the product, (this is the result of learning) is studied.

Vygotsky believed that all higher mental functions must first be filtered through an external stage in the form of social occurrences. Also, the assumption underlying the social cognitive development is that reciprocal interaction among children around suitable academic tasks created in the knowledge of concepts and critical skills. Vygotsky used an important concept to explain the reciprocal interaction of the difference between what a child can achieve independently and what a child can achieve with guidance and encouragement from a skilled partner. The important concept in the Zone of Proximal Development (ZPD). Vygotsky’s notion of ZPD is meaningful to learning. Such learning happens through interaction with each other in the ZPD. Vygotsky defines the ZPD as: “the distance between the actual developmental levels as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers”.

According to Vygotsky, children first develop lower mental functions, such as simple perceptions, associative learning, and involuntary attention; then through social interaction with more advanced peers and adults, they eventually develop high mental functions such as language, counting, problem solving skills, voluntary attention, and memory Schemas. He proposed that a child’s immediate potential for cognitive growth is bounded on the lower and by what the child can accomplish on his/her own and on the upper end by what the child can accomplish with the help of a more knowledgeable other such as a peer or teacher. This theory is related to the study as it provides a strong support for the inclusion of cooperative learning techniques in classroom instruction. Vygotsky stressed the importance of cooperative activities in his principle of social interaction. He argues that the development of children is promoted by cooperative activities because children of the same age, work in one another’s ZPD and model behavior which is more effective than children working individually. More so, mental functions for the individual. This only happens when a child joins, in cooperation and interaction, with his/her peers. Hence, social interaction needs to be encouraged in the process of learning because if social interaction or group interaction does not exist, students may not reach and shared goals or achievement. Therefore, reciprocal and problem-solving instructional strategies which the present study promotes are cooperative learning techniques that encourage social interaction and peer assistance in the learning process. The principle of these two techniques conform to the Vygotsky theory of cognitive development.

Empirical Review

Edmund, Charita, and Rosie (2022) determined the effect of 3C’s (Contextualization, Communication, and Connection) on Grade II students' interest and problem-solving skills in General Mathematics at Sankan National High School. The study employed a pretest-posttest quasi-experimental control group design, using mean and standard deviation to answer research questions and ANCOVA for data analysis. Results indicated that the 3C’s method significantly increased participants' mathematics interest and achievement compared to the 7E’s method and enhanced students' ability to analyze and understand lessons through discussion and

communication of ideas in contextualized problems. This reviewed work is related to the present study in terms of problem-solving and student interest, sharing a quasi-experimental design and the use of mean and standard deviation. However, it differs by using one-way ANCOVA (compared to the present study's ANCOVA for hypothesis testing) and not considering student academic achievement, which is a focus of the present study investigating the effect of reciprocal and problem-solving instructional strategies on student academic achievement and interest in secondary school Economics, thus highlighting the need for the current research.

Ejike (2010) investigated the effects of reciprocal peer tutoring on achievement, interest, and perceived self-efficacy in reading comprehension of senior secondary school students in Enugu State, Nigeria, using a nonequivalent pretest-posttest quasi-experimental design. The study involved 174 SS II students and used the Test of Comprehension (TOC), Students' Reading Comprehension Interest Rating Scale (SRCIRS), and Students' Self-Efficacy Rating Scale (SSERS). Data were analyzed using mean, standard deviation, and ANCOVA. Key findings showed that reciprocal peer tutoring significantly improved achievement, interest, and perceived self-efficacy in reading comprehension, and that gender had no significant influence based on this strategy. This study is related to the present study in terms of reciprocal strategy, interest, and academic achievement, both employing a quasi-experimental design and ANCOVA. However, it differs in focus (reading comprehension vs. secondary school Economics), population, and instruments (TOC, SRCIRS, SSERS vs. EAT and EIS). The present study's investigation into the effect of reciprocal and problem-solving instructional strategies on student academic achievement and interest in secondary school Economics in Wukari Education Zone, Taraba State, justifies its necessity.

Ezeudu, Samson, and Ogochukwu (2017) examined the effects of concept mapping instructional strategy on students' academic achievement and interest in some value concepts in upper basic education social studies, adopting a non-equivalent quasi-experimental design with 3,606 JSS II students. Using the Social Studies Achievement Test (SOSAT) and Social Studies Interest Inventory (SOSII), the study found that concept mapping positively affected student achievement and interest, gender had no significant influence, and location did. This reviewed work shares variables of interest (student achievement, interest, and gender), design, and data analysis methods with the current study but differs in population, instruments, subject (Social Studies vs. Economics), and the instructional strategy investigated (concept mapping vs. reciprocal and problem-solving), thus indicating the need for the present research.

Uchechukwu and Esther (2017) investigated the effects of project-based learning and guided inquiry on the sustainability of students' interest in literature in Ebonyi North Education Zone, Ebonyi State, using a quasi-experimental design with 110 SS II students. The Literature-in-English Interest Inventory (LIEII) was used, and data were analyzed with mean, standard deviation, and ANCOVA. Results showed that project-based learning performed better than guided inquiry, and male students had more interest in literature. This reviewed work shares design, data analysis methods, interest, and gender variables with the current study but differs in focus (Literature in English vs. SS II Economics), instrument (LIEII vs. EAT and EIS), and the instructional strategies investigated (project-based learning and guided inquiry vs. reciprocal and problem-solving), justifying the need for the present study.

Nnamani and Akabogu (2020) studied enhancing interest among senior secondary school students in expository essay writing in South East Nigeria using Reciprocal Peer Tutoring and a quasi-experimental design. The study involved 75 male and female SS II students and used the Expository Essay writing Interest Inventory (EEWII). Findings indicated that reciprocal peer

tutoring impacted students' interest in expository essays, and there was no significant difference in mean interest scores between genders taught with reciprocal peer tutoring versus the traditional approach, nor was the interaction effect of gender and teaching approach significant. This reviewed study is related to the present study by considering gender as a moderating variable and examining interest, using a quasi-experimental design and ANCOVA. However, it differs in focus (expository essay writing vs. senior secondary school Economics), instrument (EEWII vs. EAT and EIS), population, and the specific instructional strategy interaction investigated (reciprocal peer tutoring vs. reciprocal and problem-solving), hence the need for the present study.

Oviawe, Tazhenova, Azman, and Shah (2021) investigated promoting students' academic performance and interest in Block-laying and Concreting Works using Future-Wheel Instructional Strategies versus Problem Solving in Edo State, Nigeria, employing a non-equivalent control group quasi-experimental design. The study involved 80 vocational II students and used the Block-laying and Concreting Works Performance Test (BLCWPT) and Block-laying and Concreting Works Students' Interest Inventory Scale (BLCWSIIS). Findings showed a significant mean effect of Futures-Wheel strategy on performance and interest, and no significant mean effect of gender on performance. This reviewed study shares variables of interest (gender, problem-solving, and interest), design, and data analysis methods with the present study but differs in the instructional strategies used (Future-Wheel vs. reciprocal and problem-solving) and the subject area, thus justifying the need for the current study.

Onuoha et al. (2018) examined the effects of the reflection method on Economics students' achievement in senior secondary schools in Udenu Local Government of Enugu State, using a quasi-experimental non-equivalent control group design with 933 SS III students. The Basic Economics Achievement Test (BEAT) was used, and data were analyzed with mean, standard deviation, and ANCOVA. Findings indicated that the reflection method had a greater effect on achievement in market structure concepts than the conventional method, and there was no significant gender difference in achievement or a significant interaction effect between instructional strategy and gender. This study is similar to the current study in terms of design and data analysis, also using gender as a moderating variable, but differs in the student level (SSS III vs. SSS II), instrument (BEAT vs. EAT and EIS), and the instructional strategy investigated (reflection method vs. reciprocal and problem-solving). Furthermore, the reviewed study disregarded student interest, which the present study considers crucial, further justifying the need for this research.

Statement of the Problem

Research reports indicate a prevalent use of conventional teaching strategies among teachers, which may not align with the needs of 21st-century learners. This necessitates a positive change in the interest of students in Economics. One potential avenue for improving engagement in Economics could be through a shift in the instructional strategies employed in secondary schools.

Economics, as designed within the secondary school curriculum, is intended to be learner-centered and activity-oriented. However, research suggests that many Economics teachers tend to deliver lessons primarily through a "talk and chalk" method, rather than actively involving students in the learning process. The manner in which Economics lessons are conducted in secondary schools often lacks observable interest or enthusiasm, potentially stemming from the adopted strategies. This instructional approach appears to contradict the evolving emphasis in social science teaching towards learner-centered and activity-oriented pedagogy. This may

contribute to challenges faced by students in Senior Secondary School Examinations (SSCE) in Economics.

Consequently, given the perceived limitations of conventional strategies, this study is essential in Economics to investigate the effects of reciprocal and problem-solving instructional strategies on students' interest, and if found beneficial, to recommend them as suitable instructional strategies for Economics lessons. The rationale for selecting these specific instructional strategies is based on findings from researchers such as Ede & Uchenna (2018), Alli (2019), Serap, Gamze & Mustafa (2010), who have demonstrated their effectiveness in other subjects like English, Language, Physics, and Econometrics. However, to the best of the researcher's knowledge, no similar study has been conducted specifically within the subject area of Economics, thus highlighting the need for this investigation.

Research objectives

The general purpose of this study was to compare the effects of reciprocal and problem-solving instructional strategies on students' interest in senior Secondary School Economics in Wukari Education Zone, Taraba State. Specifically, the study sought to find out:

1. The difference in the mean (\bar{x}) interest rating scores of students taught Economics using reciprocal and problem solving strategies.
2. The difference in the mean (\bar{x}) interest rating scores of male and female students in Economics.
3. The interaction effect of gender and two strategies on students' interest in Economics.

Research Questions

The following research questions guided the study.

1. What is the difference in the mean (\bar{x}) interest rating scores of students taught Economics using the reciprocal and problem solving strategies?
2. What is the difference in the mean (\bar{x}) interest rating scores of male and female students in Economics?
3. What is the interaction effect of gender and two strategies on students' interest in Economics?

Hypotheses

The following null hypotheses were formulated to guide the study and were tested at 0.05 level of significance.

H₀₁: There is no significant difference in the mean (\bar{x}) interest rating scores of students taught Economics using reciprocal and problem solving strategies.

H₀₂: There is no significant difference in the mean (\bar{x}) interest rating scores of male and female students in Economics.

H₀₃: There is no significant interaction effect of gender and strategies on mean interest scores of students' in Economics.

Methodology

This study adopted a quasi-experimental research design, specifically a two-by-two (2x2) factorial pre-test, post-test design, where intact classes were assigned to treatments rather than individual students. This design was chosen because random assignment of subjects was not feasible. The treatment groups underwent a pre-test before the intervention and a post-test afterward.

The population of the study comprised all 975 Senior Secondary School II Economics students from 30 public secondary schools in Wukari Education Zone, Taraba State, Nigeria, consisting of 181 students in Ibi Local Government Area and 794 in Wukari Local Government Area. The class was selected as they were not preparing for external examinations, allowing time for experimental sessions.

The sample size for the study included 92 (59 males and 33 females) SS II Economics students from four intact classes across four co-educational secondary schools, chosen using a multistage sampling procedure. This included two intact classes from Wukari LGA and two from Ibi LGA. Simple random sampling (balloting with withdrawal and without replacement) was used to assign the reciprocal and problem-solving instructional strategies to the four selected classes.

Data were collected using the Economics Interest Scale (EIS), developed by the researcher. The EIS is a 15-item questionnaire structured on a four-point scale. Four lesson plans were designed for the reciprocal instructional strategy and four for the problem-solving instructional strategy.

The Economics Interest Scale (EIS) underwent both face and content validations by experts from the University of Nigeria, Nsukka, who checked wordings, language expressions, hypotheses, research questions, and lesson plans. Their corrections and suggestions were incorporated to improve the instrument. The cognitive level of Bloom's taxonomy was updated to the revised version.

The reliability of the EIS instrument was established using the Cronbach Alpha reliability test, yielding an internal consistency coefficient of 0.81. This was determined by pilot-testing on thirty SS II students from Government Day Secondary School Kumbo, who shared similar attributes with the study population but were not part of the actual study.

Experimental procedures involved seeking consent from school administrators, training four Economics teachers as research assistants on the use of research instruments and lesson plans, and administering a pre-test. Following a microteaching exercise, the research assistants proceeded with three weeks of rigorous treatment administration, teaching Economics using either the Reciprocal Instructional Strategy or the Problem Solving Instructional Strategy lesson plans. After the treatment, the post-test was administered to all students.

To control extraneous variables, measures were taken for initial group differences (assigning two different schools to each group), experimental bias (using regular Economics teachers), experimental mortality (designating two sessions per week), teacher variable (researcher prepared and discussed lesson plans, organized microteaching, and scored tests), and subject interaction (using four different schools). An interval of four weeks was allowed between the pre-test and post-test to minimize sensitization and maturation effects.

Data gathered were analyzed using Statistical Package for Social Sciences (SPSS) version 20. Research questions were answered using descriptive statistics of mean and standard deviation. Analysis of Covariance (ANCOVA) was used to test the hypotheses at a 0.05 level of significance, chosen for its ability to account for group variations between experimental groups.

RESULTS

Research Question One

What is the difference in the mean interest rating scores of Students taught Economics using the reciprocal and problem solving strategies?

Table 1: Mean and standard deviation of interest rating scores of students taught Economics using the reciprocal and problem solving strategies

Strategies	PreINT			PostINT		Mean Difference
	N	\bar{x}	SD	\bar{x}	SD	
Reciprocal	38	39.58	4.48	51.50	3.36	11.92
Problem Solving	54	38.59	4.76	50.09	5.86	11.50

Results in Table 1 shows the mean interest rating scores of students taught Economics using the reciprocal and problem solving strategies. Students who were exposed to reciprocal strategy had a mean interest rating score of ($\bar{x} = 39.58$, $SD = 4.48$) at the pretest and a mean interest rating score of ($\bar{x} = 51.50$, $SD = 3.36$) at the posttest with a mean difference of 11.92, whereas those exposed to problem solving strategy had a mean interest rating score of ($\bar{x} = 38.59$, $SD = 4.76$) at the pretest and a mean interest rating score of ($\bar{x} = 50.09$, $SD = 5.86$) at the posttest with a mean difference of 11.50. The result shows that the interest rating scores of students exposed to the two strategies improved with mean differences of 11.92 and 11.50 for those exposed to reciprocal strategy and problem solving strategy respectively. The students exposed to reciprocal strategy performed on interest rating slightly better than those exposed to problem solving strategy.

Hypothesis One

H0₁: There is no significant difference in the mean interest rating scores of Students taught Economics using reciprocal and problem solving strategies.

Table 2: Analysis of covariance (ANCOVA) of the difference in the mean interest rating scores of students taught Economics using reciprocal and problem solving strategies

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Dec. (at $\alpha = 0.05$)
Corrected Model	735.567 ^a	4	183.892	10.344	.000	.322	
Intercept	944.431	1	944.431	53.125	.000	.379	
PreINT	690.467	1	690.467	38.839	.000	.309	
Strategy	11.467	1	11.467	.645	.424	.007	NS
GENDER	1.287	1	1.287	.072	.789	.001	NS
Strategy * GENDER	.762	1	.762	.043	.836	.000	NS
Error	1546.650	87	17.778				
Total	238524.000	92					
Corrected Total	2282.217	91					

Note: S = Significant, NS = Not Significant, Dec. = Decision

The result in Table 2 shows that an F-ratio of ($F(1, 92) = .645, p = .424, \eta^2_p = .007$) was obtained for the difference in the mean interest rating score of students taught Economics using reciprocal and problem solving strategies. Since the associated probability value of .424 is greater than the 0.05 level of significance at which the null hypothesis was set to be tested, the null hypothesis, which stated that there is no significant difference in the mean interest rating score of students taught Economics using reciprocal and problem solving strategies, is accepted. Thus, the inference drawn is that there is no significant difference in the mean interest rating score of students taught Economics using reciprocal and problem solving strategies. This can be interpreted to mean that the two strategies proved to be effective in teaching students in Economics. The result further showed an effect size of ($\eta^2_p = .007$), which indicates that only 0.7% of the variance in interest rating of students in Economics can be explained by the two strategies.

Research Question Two

What is the difference in the mean interest rating scores of male and female students in Economics?

Table 3: Mean interest rating scores of male and female students in Economics

Gender	PreINT			PostINT		Mean Difference
	N	\bar{x}	SD	\bar{x}	SD	
Male	59	39.12	4.65	50.63	5.46	11.51
Female	33	38.79	4.72	50.76	4.16	11.97

The result in Table 3 shows the mean interest rating scores of male and female students in Economics. The male students had a pretest mean interest rating score of ($\bar{x} = 39.12$, $SD = 4.65$), and a posttest mean interest rating score of ($\bar{x} = 50.63$, $SD = 5.46$). The mean difference for the male students was 11.51. The female students on the other hand had a mean interest rating score of ($\bar{x} = 38.79$, $SD = 4.72$) at pretest and a mean interest rating score of ($\bar{x} = 50.76$, $SD = 4.16$) at posttest. The mean difference for the female students was 11.97. Female students taught Economics had a slightly higher mean gain on their interest rating scores than their male counterparts, according to the finding.

Hypothesis Two

H0₂: There is no significant difference in the mean interest rating scores of male and female students in Economics.

The result in Table 2 also shows the significant difference in the mean interest rating scores of male and female students in Economics. The result shows that an F-ratio of ($F(1, 92) = .072$, $p = .789$, $\eta^2_p = .001$) was obtained. Since the associated probability value of .789 is greater than the threshold of 0.05 set as the level of significance, the null hypothesis, which stated that there is no significant difference in the mean interest rating scores of male and female students in Economics, is not rejected. Thus, inference drawn is that the difference in the mean interest rating scores of male and female students in Economics is not statistically significant. The result further showed the effect size of ($\eta^2_p = .001$), which indicates that 0.1% variance in interest rating of students' in Economics can be explained by gender. This implies that gender is not a significant factor in determining interest rating scores of students in Economics.

Research Question Three

What is the interaction effect of gender and two strategies on students' interest rating in Economics?

Table 4: Interaction effect of two strategies and gender on students' interest rating in Economics

Strategies	Gender	PostINT		
		N	\bar{x}	SD
Reciprocal	Male	23	51.39	3.64
	Female	15	51.67	2.99
Problem Solving	Male	36	50.14	6.36
	Female	18	50.00	4.89

The result in Table 4 shows the interaction effect of gender and two strategies on students' interest rating in Economics. The posttest mean interest rating score of male students exposed to reciprocal strategy was ($\bar{x} = 51.39$, $SD = 3.64$). The female students exposed to reciprocal

strategy had a posttest mean interest rating score of ($\bar{x} = 51.67, SD = 2.99$). The result in Table 8 also shows that male students exposed to problem solving strategy had a mean interest rating score of ($\bar{x} = 50.14, SD = 6.36$) at the posttest. At the posttest also, female students exposed to problem solving strategy had a mean interest rating score of ($\bar{x} = 50.00, SD = 4.89$). The result shows a slight mean difference between male and female students exposed to reciprocal strategy in favor of the female. Similarly, the result shows a slight mean difference between male and female students exposed to problem solving strategy in favor of the male. This prompted further analysis of the interaction effect using an inferential statistic.

Hypothesis Three

H0₃: There is no significant interaction effect of gender and two strategies on the mean interest rating scores of students' in Economics.

The result in Table 2 shows that an F-ratio of ($F(1, 92) = .043, p = .836$) was obtained for the interaction effect of gender and two strategies on the mean interest rating scores of students' in Economics. Since the associated probability value of .843 is greater than the threshold of 0.05 set as the level of significance, the null hypothesis, which stated that there is no significant interaction effect of gender and two strategies on the mean interest rating scores of students' in Economics, is not rejected. Thus, the inference drawn is that the interaction effect of gender and two strategies on the mean interest rating scores of students' in Economics is not statically significant. Figure 1 also revealed that there was no significant interaction effect of gender and two strategies on the mean interest rating scores of students' in Economics. This is evident as the lines drawn against gender and the two strategies do not intersect at any point on the graph. The graph is shown below.

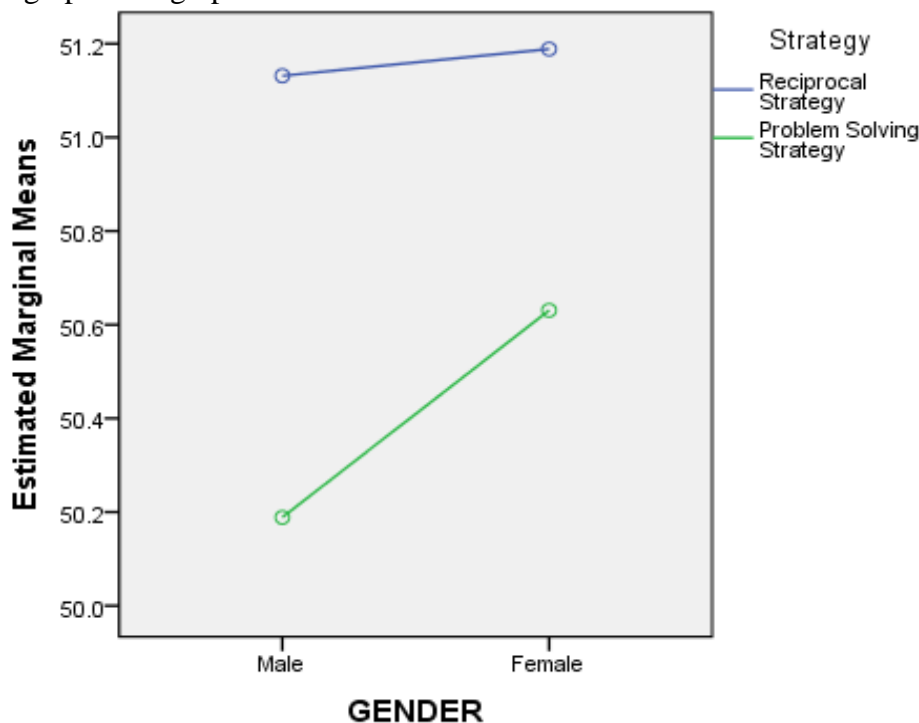


Fig. 1. Interaction effect of gender and two strategies on the mean interest rating scores of students' in Economics.

Summary of Findings

From data analysis and interpretation of results, the following findings emerged.

1. The findings of the study showed that students exposed to reciprocal strategy performed on interest rating slightly better than those exposed to problem solving strategy. However, there is no significant difference in the mean interest rating scores of students taught Economics using reciprocal and problem solving strategies.
2. The finding of the study showed that female students taught Economics had a slightly higher mean gain on their interest rating than their male counterparts. However, the difference in the mean interest rating scores of male and female students in Economics is not statistically significant.
3. The result showed a slight interest rating mean difference between male and female students exposed to reciprocal strategy in favor of the male. Also, the result shows a slight mean difference between male and female students exposed to problem solving strategy in favor of the female. However, the interaction effect of gender and two strategies on the mean rating scores of students' in Economics is not statically significant.

Discussion of Findings

Effect of Reciprocal and Problem Solving Instructional Strategies on Students' Interest in Secondary Schools Economics

The finding of the study revealed that the interest rating scores of students exposed to the two strategies improved, however, students exposed to reciprocal strategy had a slightly higher mean interest rating scores than those exposed to problem-solving strategy. The finding of the study revealed that there is no significant difference in the mean interest rating score of students taught Economics using reciprocal and problem solving strategies as shown in the result represented in Table 2. The result shows that when students were exposed to the two strategies, their interest rating scores in Economics improved. This can be interpreted to mean that the two strategies proved to be effective in teaching students in Economics.

The finding of this study collaborates with those of Nnalue, et al., (2016) who conducted a study on the effect of peer tutoring instructional strategy on students' academic achievement and interest in Economics and discovered among, other things, that students taught Economics in senior secondary schools with peer tutoring had better achievement and interest than their counterparts taught using the lecture method. The result of this study also agrees with Christopher, Nwandikor, Chetachukwu and Christian' (2020) findings that the use of reciprocal instructional Strategy was more superior in enhancing interest and achievement of Physics students than lecture method. The findings of this study therefore provide empirical evidence that reciprocal and problem solving instructional strategies are efficacious in improving the interest of secondary school Economics students to perform better on their achievement.

Influence of Gender on students' Interest Rating in Secondary School Economics.

The findings of this study on the effect of gender on student's interest rating scores in secondary school Economics (when both strategies are used) showed that female students had higher mean interest rating scores than the male students. The result also revealed that there is no significant difference for both boys and girls on mean interest rating scores. The finding of this study revealed that gender does not significantly influence the mean interest rating scores of secondary school students in Economics. This implies that gender is not a significant factor in determining the interest rating scores of secondary school students in Economics. This may be as a result of the fact that both male and female students in Economics were exposed to same learning and testing condition during experiment.

The study's findings are consistent with those of Ezeudu, Samson, and Ogochukwu (2017), who conducted a study on the effects of concept mapping instructional strategy on student's academic achievement and interest in some value concepts in upper basic education social studies and discovered that gender has no significant influence on student's achievement and interest when taught value concepts using concept mapping. This implies that, no gender bias existed from the

study. However, the result is not in agreement with Uchechukwu and Esther (2017), who investigated the effects of project-based learning and guided inquiry towards teaching and sustainability of student's interest in literature, the result revealed that male students had more interest in literature than the female students, this was pointed out on the result of the pre-test and post-test scores of interests mean scores. This controversy has remained unresolved as research findings have cumulatively indicated contradicting evidence of the interest rating scores of students in Economics due to gender.

Interaction effect of treatment and Gender on Students' Interest Rating in Secondary School Economics

The finding of the study revealed that the interaction effect of two instructional strategies and gender on the mean interest rating scores of secondary school students in Economics is not statistically significant. This implies that gender does not influence reactions to any of the instructional strategies. The lack of significant interaction effect of two instructional strategies and gender could be as a result of exposing both male and female students in secondary school Economics to the same treatment conditions at the same time.

The result of this study is supported by the result in Figure 3, which revealed that there was no significant interaction effect of gender and two strategies on the mean interest rating scores of students' in Economics. This is evident as the lines drawn against gender and the two strategies do not intersect at any point on the graph. The result is also consistent with Oviawe, Tazhenova, Azman, and Shah (2021), who conducted a study on promoting student's academic performance and interest in Block-laying and Concreting Works using Future-Wheel Instructional Strategies versus Problem Solving and found, among other things, that there was no interaction effect of gender and two instructional strategies on Economics interest rating. Hence, the findings of this study have added to the empirical evidence that there is no significant interaction effect of two instructional strategies and gender on the mean interest rating scores of students, especially those in Economics.

Conclusion

Based on the findings of the study on the effect of reciprocal and problem solving instructional strategies on students' interest in secondary school Economics, it is therefore concluded that the reciprocal and problem solving instructional strategies are both effective in enhancing the interest of secondary school students in Economics. The study also concludes that gender do not significantly influence the mean interest rating scores of secondary school students in Economics. This implies that gender is not a significant factor in determining the interest of secondary school students in Economics. More so, the study concludes that gender do not influence reaction to reciprocal and problem solving instructional strategies among students in Economics.

Educational Implication of the Findings of the Study

Based on the conclusions from the findings, educational implications of the findings are stated as they concern to teachers, students and curriculum planners.

1. The implication of these findings to the teachers is that teachers will be encouraged to use reciprocal and problem solving instructional strategies in teaching Economics since it has proved to enhance students' interest.
2. The students of Economics would from the findings of the study find that both males and females can do well in the subject Economics and would stop thinking that Economics is reserved either for males or females. Thus, the findings of the study would help reduce gender stereotipism in the teaching and learning of Economics in secondary schools. Moreover, the findings of this study would encourage the students to face the challenges involve in studying Economics without thinking that Economics is a difficult subject.
3. To the curriculum planners, since innovative instructional strategies have been introduced in educational system, the findings of this study will encourage them to

incorporate the reciprocal and problem solving instructional strategies in the Economics curriculum and other innovative technique.

Recommendation

On the basis of the findings and implications of this study, the following recommendations were made:

1. The government should organize workshops, conferences, and seminars for Economics teachers to promote the use of reciprocal and problem-solving instructional strategies in secondary school Economics.
2. Curriculum planners should incorporate these strategies during curriculum planning to create a flexible curriculum that supports these strategies. This approach enhances students' interest and ensures they are not left out.
3. Teachers should also help students understand their roles in reciprocal and problem-solving-based Economics instruction, as these are learner-centered approaches.
4. More frequent quiz competitions should be organized by schools to provide opportunities for students to compete irrespective of gender.
5. Parents, guardians, and caregivers should avoid segregation in education for children regardless of their sex. This will ensure that students are not left out in the instruction process.

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