

Effect of Cooperative Learning on High School Students' Performance in Economics in Ghana

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Abstract: The study sought to establish the impact of cooperative learning on economics students' performance in Senior High School in Ghana, using a quasi-experimental design that included pre-tests and post-tests. The study engaged 164 senior high school economics students (81 in the control group and 83 students in the experimental group). The study used a 50-item performance test and a 29-item perception questionnaire. Data analysis involved descriptive statistics (frequency, percentages, means and standard deviations) and inferential statistics (independent sample t-test and paired sample t-test). The study revealed that senior high school economics students positively perceived the use of cooperative learning strategies in teaching economics. It revealed that economics students in the experimental and control groups had the same level of poor performance in economics before conducting the intervention. A significant difference emerged in the post-test performance of students in the experimental group, revealing improved performance after teaching the group using cooperative learning strategies. This suggests that cooperative learning strategies significantly affected the students' performance. The study, recommends that senior high school economics teachers need to incorporate cooperative learning strategies in teaching economics topics to improve students' performance.

Keywords: Cooperative learning; economics; jigsaw; senior high School, think-pair-share, teaching strategies.

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Introduction

Education is critical in promoting human capital development by enhancing skills, knowledge and abilities to contribute to a countries' economic growth. Dada (2009) intimates that education must foster holistic development in learners in aspects such as physical, intellectual, moral and emotional fortitudes. That is why the United Nations' SDG 4 emphasises the need for inclusive, equitable and quality education and lifelong learning. Through

education, learners gain knowledge, develop skills, imbibe new behaviour and alter their attitudes regarding their obligation as worthy citizens to thrive in society. Education equips individuals with employable skills, enabling the achievement of the SDG 8, which promotes sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Because of the essence of education, many societies have established specific institutions that employ diverse

ways to promote effective and acceptable learning, which must lead to enhanced academic performance. Poor performance in school could frustrate the efforts developing nations like Ghana are making to achieve the SDGs. Therefore, teachers responsible for enacting the school curriculum must plan, organise and implement the teaching-learning process to improve learner performance.

Most developed and developing nations like Ghana make a considerable investment in education. For instance, Adu and Galloway (2015) observed that education receives a substantial share of the national budget in South Africa. In Ghana, implementing the free senior high school policy has led to huge expenditures on the nation's budget. Despite the massive educational investment in countries like Ghana, there seems to be an abysmal performance in mathematics and related subjects such as economics. Nazeer (2006), states that high schools teach economics as a separate subject for examinations to prepare students for numerous school certificate programs.

As indicated by Van Wyk (2015), economics education is essential to the health of a country's economy. As Acquah and Anti-Partey (2023) pointed out, when households receive the capacity to build wealth, they also develop the capacity to produce more economically stable neighborhoods and communities. In recognition of the importance of economics education to Ghana, the rationale for the senior high school economics syllabus states that the study of Economics helps the individual to develop skills for managing his/her economic resources efficiently both in the family and business (Ministry of Education, 2010). Therefore, teaching economics at the Senior High School level is vital for developing learners' understanding of economics. Although there has been a rise in the number of students offering the subject, achievement in economics at the pre-tertiary level has not been good over the years (Adu, 2012).

The Chief Examiner's Reports for the WASSCE from 2017 to 2020 attest to the poor performance of economics students in Ghana, especially in mathematics-related topics, including national income accounting and determination and elasticity (West African Examination Council, 2017, 2018, 2019 & 2020). Felder and Brent (2007) revealed that it is challenging for most students to learn when complex topics require their classmates' assistance. Adu and Adeyanju (2013) also believed that to

succeed in economics, studies at the Senior High School; students need to speak and reason to build their confidence in solving economic problems, which one can achieve through cooperative learning. With this in mind, there have been debates over the years concerning the most effective pedagogical techniques in education. Abreh et al. (2018) observed that key factors that amount to poor performance by candidates include inadequate qualified teachers to handle various subjects, employment of inappropriate approaches or methodologies to teaching and learning respective subjects and limited time to enact and complete the curriculum.

There appears to be a shift towards team or cooperative learning since researchers have concluded that cooperative learning improves students' intellectual capability. With cooperative learning, students study in groups with the teacher's guidance to accomplish similar objectives using social skills. Several studies indicate that cooperative learning can improve students' performance, providing long-term memory, positive attitude, social skills, and self-concept. Consequently, there should be more opportunities for collaboration to create solutions through discussions and problem-solving activities (Slavin et al., 2003; Dale et al. 2005; Asare, 2016). Research has found improvements in students' economic achievement (Adu & Adeyanju, 2013). According to Shimazoe and Aldrich (2010), the adoption of the cooperative learning strategy has some advantages for students, such as encouraging in-depth learning, improving grades as compared to personal learning, learning civic values and social skills, emulating higher-order critical thinking skills and promoting personal growth, among others. Learners' attitudes, views and behaviors are crucial determinants of the success of such instructional methods Farzaneh & Nejadansari, 2014).

However, a literature review indicates that some students tend to have negative attitudes towards cooperative learning due to the challenges they face. Such challenges include the tendency of some students to hijack discussions, some not pulling their weight or contributing to discussions, and heavy workloads on students, making it difficult for them to make time for group discussions, among other factors (Scherman & Du Toit 2008, Freeman & Greenacre, 2011, O'Leary & Stewart, 2013, Asare, 2016). These differences could probably result from

different contexts; hence, there is a need to conduct more research on the subject in various contexts.

Besides, there appears to be a lack of research on the impact of cooperative learning on students' diversity and learning in the economics classroom, especially in Ghana. As Farzaneh and Nejadansari (2014) indicated, students' attitudes towards a method of instruction are essential. Attitude may influence perceptions. Consequently, economics students may develop a positive perception of an intervention if it positively affects their learning. It was, therefore, essential in this study to consider students' perception of the use of cooperative learning in the economics classroom because most of the studies considered attitude and not perception. Although both attitude and perception are interconnected such that attitude can shape perception and perception can shape attitude, this study was more concerned about how senior high school economics students process, understand and see cooperative learning as a teaching method for teaching economics. Such perception would then inform the continuous use or otherwise for teaching national income accounting and determination, and elasticity of demand.

Several studies took place on the impact of cooperative learning, but they largely focused on other subject areas and not Senior High School Economics. This gap in the literature could be due to the earlier observation made by Watts and Becker (2008) that the median proportion of class time dedicated to cooperative learning is only six per cent, indicating that cooperative learning exercises are not widely used in economics classrooms. Furthermore, most of the studies on cooperative learning were either outside Ghana or were in mathematics or they took place at the tertiary (Adu & Galloway, 2015; Farzaneh & Nejadansari, 2014; Akanmu, 2019; Grech, 2013; Opdecam et al., 2014; Gubbad, 2010; Enu et al., 2015; Reda, 2015; Sarfo & Ellen, 2011; Kakraba et al., 2011; Marks & O'Connor, 2013; Asare, 2016; Usman et al., 2018).

In Ghana, studies on the use of cooperative learning focused on core mathematics (Assan-Donkoh et al., 2022) and biology (Ayeriga, 2021) at the Senior High School level. Asare's (2016) study employed a survey design while Assan-Donkoh et al. (2022) and Ayeriga (2021) did not explicitly specify the design used for their research. Little or no work in Ghana seems to have taken place on the impact of cooperative learning on students' performance in

SHS economics using a quasi-experimental design. Hence, a geographical and methodological gap needed a response. Considering the revelation in the extant literature, that cooperative learning positively impacts students' learning in other disciplines, it was essential to conduct this study to ascertain its impact on senior high school economics students' performance in Ghana. Therefore, it was necessary to study the impact of cooperative learning on students' performance in economics to fill the knowledge gap.

Literature Review

Farzaneh and Nejadansari (2014) assert that the infusion of cooperative learning methods in educational programs commenced in subjects like mathematics and science. With time, this instruction method proved effective and took place in other subjects, such as economics. The question that needs a response here is whether cooperative learning is a teaching or learner-centered method. Based on their definition, some researchers see cooperative learning as a teaching approach. For example, Riley and Anderson (2006) saw cooperative learning as a pedagogical technique where students learn by explaining the subject matter to their peers and gaining knowledge from them. Similarly, Wichadee and Orawiwanakul (2012) intimate that cooperative learning is a teaching approach where learners of different abilities work in small groups and engage in various learning activities.

On the contrary, researchers such as Olsen and Kagan (1992) reported a different perspective, claiming it is a learner-centered activity. To them, cooperative learning is a style of group instruction, where learners are responsible for their own learning and are encouraged to advance the learning of others. Learning depends on socially regulated information exchange between participants in groups. Koppenhaver and Shrader (2003) also concur that cooperative learning is a learner-centered approach as its goal is to elevate comprehension and logical thinking, foster critical thought and enhance the precision of long-term retention. Teaching methods are not an end but a means to an end; they are the vehicles we use to lead learners to specific learning outcomes (Bourner, 1997).

Farzaneh and Nejadansari (2014) observed from the literature of Johnson et al. (2000) that the cooperative learning approach encompasses a

broad array of instructional methods such as Student-Team-Achievement-Division (STAD), Academic controversy (AC), Group investigation (GI), Team-Games-Tournaments (TGT), among others. McLeish (2009) also identified cooperative learning strategies, such as the think-pair-share, Jigsaw and round table methods. Asare (2016) also highlighted the student Team Learning method (STLM), the group investigation method and the learning together (LT) method. This study discusses the think-pair-share and the jigsaw instruction techniques.

Think-pair-share is a cooperative learning technique in which learners collaborate to address a problem or respond to a query related to an assigned reading. Instructors present a question, prompting students first to contemplate their responses independently. Subsequently, they are encouraged to discuss their thoughts with a peer (pair). Finally, these pairs share their discussions with the class while facilitating ongoing conversation. This approach necessitates students to (1) independently contemplate a topic or respond to a question and (2) exchange ideas with fellow students. Engaging in discussions with a partner enhances participation, maintains focus and immerses students in grasping the reading material. It affords students the opportunity for critical thinking, fostering an educational setting that fosters high-quality responses. Think-pair-share allows students to collaborate in teams towards a common objective, enhancing their understanding and that of their peers in a supportive setting that encourages learning from errors (Johnson & Johnson, 1999).

The jigsaw teaching method, on the other hand, involves a collection of topics students fully develop individually before coming together to form a complete concept. Jigsaw is a collaborative learning approach that empowers students within a “home” group to specialize in a specific part of the topic (Crone & Portillo, 2013). These students then convene with counterparts from other groups assigned the same part. After mastering the material, they return to their “home” groups to instruct their fellow members. This strategy essentially turns each student in the “home” group into a piece of a larger puzzle related to the topic (Stanczak et al., 2022). This cooperative learning method allows individuals or small groups to take responsibility for subcategories within a broader topic. The Jigsaw technique effectively promotes students’ interaction with peers and the course

content. Moreover, it operates on the assumption that students must comprehend the material thoroughly to effectively teach it to their peers, thereby fostering individual accountability.

Beebe and Masterson (2003) observed some benefits students reap from cooperative learning as follows:

- a) Learners remember group discussions better. This implies that group learning fosters effective learning and comprehension, leading to improvement in performance.
- b) Groups have more information than individual learners do. In the group learning approach, students with different backgrounds and experiences with greater resources tend to tap useful and more available information.
- c) Group learning fosters creativity in line with the adage “two heads are better than one.”
- d) Learners gain a better understanding of themselves since group work permits individuals to assess themselves better concerning how others see them.
- e) The decision in the group learning approach guides students to yield great satisfaction or output and performance.

Theoretical Underpinning

In this study, the Theoretical underpinning for cooperative learning emerged from Ivić and Vygotsky’s (1934) Sociocultural Theory of cognitive development, which explicitly emphasizes that all forms of learning and development are based on social interaction. This theory centers on the zone of proximal development, which portrays what the student can achieve independently and what the student can achieve with the help of learning with peers. This shows that each student has a range of learning potential. In the economics classroom, the student might be able to comprehend some topics but may need help from peers that are more knowledgeable or the teacher to understand certain topics that may be technical. Vygotsky implies that what the student can achieve through cooperative learning today, they can accomplish that tomorrow alone. This necessitates using the collaborative learning method in the study of economics, which may consequently lead to an improvement in the performance of Economics.

The economics student is presumed to achieve some level of understanding through the traditional

teacher-centered method. However, the student is faced with the challenge of understanding certain topics that are a bit technical, such as national income accounting determination and elasticity of demand. Therefore, the researchers implemented an intervention using cooperative learning, specifically, the think-pair share and jigsaw methods, where the students interacted with peers and the teacher as a facilitator. Such a collaborative learning approach sought to boost learners' confidence, promote the discussion of knotty issues, and to foster the understanding of more complex concepts, thereby improving students' performance in economics.

Methodology

Design

The study employed a quasi-experimental design, specifically a non-equivalent pre-test post-test control group design. This study selected the design because the researchers used pre-existing intact groups. The selected school had four economics classes, two of which took part as the control group and the other two as the experimental groups. Quasi-experimental research is a valuable research design due to its capacity to exert reasonable control over various sources of bias, even though it falls short of the true experimental approach. In most cases, it offers a higher level of robustness than pre-experimental designs (McMillan & Schumacher, 2006). A quasi-experimental design allows researchers to manage the treatment

conditions but cannot randomly assign subjects to those treatments, as Ary et al., (2010) described.

In using the quasi-experimental design, the experimental groups were given interventions (taught national income accounting and determination and elasticity of demand using jigsaw and think-paired-share learning strategies) for 12 weeks while the control group received instruction through the traditional methods of instruction twice in a week. Thus, 24 lessons were prepared for the 12 weeks. After 12 weeks, the experimental and control groups were administered a post-test to determine the intervention's impact. The researchers administered a perception questionnaire that sought students' views after implementing the intervention.

Population and Sampling

The study participants were 164 SHS two economics students from the Atiwa West District, chosen for the study because the form one students had not covered enough content in the economics syllabus and the form three students were preparing for the West African Senior Secondary Certificate Examination and therefore could not participate in the study. There were four form two economics classes in the school. Two classes were randomly selected and designated as the control group (n = 81, consisting of 41 males and 40 females) and the other two as the experimental/treatment group (n = 83, 46 males and 37 females). The systematic description of the design appears in Table 1.

Table 1: Nonrandomized Control Group, Pre-test, Post-test Design

Group	Pre-test	Treatment	Post-test
Experimental group (EG)	Y1	X	Y2
Control group (CG)	Y1	-	Y2

Key: Y1 – Pre-assessment of academic performance in Economics

Y2 – Post-assessment of academic performance in Economics

X - Intervention: Jigsaw and Think-pair share

Sources of Data

The researchers collected data using a 50-item achievement test on national income accounting and determination as well as elasticity of demand and a 29-item perception questionnaire on cooperative learning.

Validity and Reliability

The pre-test scores for the achievement test yielded an internal consistency coefficient (Kuder-Richardson) of 0.84 while the post-test score coefficient was 0.79. For the questionnaire, the

established reliability was a Cronbach Alpha coefficient of 0.81, which is considered acceptable, according to Fraenkel and Wallen (2012). The pre-test took place for both control and experimental groups before the intervention to assess their level of performance in economics.

Statistical Treatment of Data

Data analysis used frequencies and percentages, means and standard deviations, independent sample t-test and paired samples t-test. The pre-test and post-test scores for the control and

experimental groups were considered normal. According to Hair et al. (2010), the data is normal if skewness is between -2 to +2, and kurtosis is between -7 to +7

Ethical Considerations

The researchers sought consent from participants before carrying out the study. They ensured participants of anonymity and confidentiality. They assigned codes to the students to match pre-test and post-test scores. Participation was voluntary and students could quit at any time during data collection. The Institutional Review Board of the University of Cape Coast issued an ethical clearance with the identification number UCCIRB/CES/2021/148 after a review of the research protocol to ensure the study conformed to required ethical standards. After the study, the researchers organized remedial teaching for

students in the control group to ensure that they were not disadvantaged.

Discussion of Results

Research Question 1: What is economics students' perception of using cooperative learning strategies?

Data emerged from a five-point Likert scale questionnaire to ascertain senior high school economics students' perceptions of using cooperative learning strategies. Only students in the experimental group responded to the questionnaire. Data collection took place after the cooperative learning strategies (jigsaw and think-pair-share methods) used to teach the experimental group. Ratings ranged from 'strongly disagree' to 'strongly agree.' A mean score within the range of 1.00 to 2.99 indicated a negative perception while scores within the 3.00 to 5.00 signified a positive perception of the cooperative learning approach. Table 2 presents the results obtained.

Table 2: Economics Students' Perception of Cooperative Learning in Economics

Working in pairs and groups has...	Mean	SD
helped me achieve a good academic performance	4.58	0.50
allowed me to build up my knowledge through other peers' input	4.55	0.52
helped me focus on assigned tasks	4.65	0.48
increased my motivation to learn	4.78	0.42
increased my creativity in learning	4.47	0.50
improved my social and interpersonal skills	4.63	0.51
helped me understand the materials	4.60	0.49
provided me with a better understanding of the economics topic	4.74	0.44
helped me to exchange knowledge, information and experience with my friends	4.63	0.49
made me solve economics problems easily	4.61	0.51
stimulated my critical thinking ability	4.59	0.50
provided me with helpful feedback	4.51	0.50
helped me be responsible –for myself and the group	4.53	0.50
improved my communication skills	4.60	0.49
made me actively participate in the learning process	4.66	0.48
made me have more new friends/make new friends in the class	4.52	0.59
increased my team spirit for learning	4.52	0.74
wasted my time explaining things to others	4.27	0.88
made it difficult for me to participate in tasks actively	4.42	0.84
gave me a sense of belongingness in the class	4.37	0.69
helped me to develop a likeness in coming to school	4.62	0.49
helped get along with other group members	4.42	0.50
I enjoyed working together/learning in groups	4.59	0.50
For me, group work is a fun learning strategy	4.57	0.50
Learning in groups is very interesting and entertaining	4.59	0.54
In my opinion, pair/group work should be encouraged in our schools	4.72	0.48
I am satisfied with other group members	4.12	0.83
I am satisfied with learning in a group	4.18	0.90
I am satisfied with working in a group	4.24	0.93
Average mean/SD	4.53	0.58

Source: Field data, 2022

Generally, it is observed in Table 2 that students in the experimental group had positive perceptions ($M = 4.53$; $SD = 0.58$) of cooperative learning strategies. The individual items also show similar results.

The result suggests that students held favourable thoughts, beliefs and feelings regarding cooperative learning strategies in their economics class. This positive perception is essential to the teaching and learning of economics at the senior high school level because it suggests that students enjoyed and were satisfied with the cooperative learning classroom environment. This positive perception is supported by empirical studies from Farzaneh and Nejadansari (2014); Asare (2016); Amedu and Gudi (2017) and Katawazai and Saidalvi (2020) and Saidalvi (2020), who highlighted that students held a positive perception of cooperative learning strategies, which

is statistically associated with favorable views of social presence and satisfaction. Considering the generally poor performance of students in economics.

Pre-test Difference in Economics Performance between Experimental and Control Groups

To ensure that the experimental and control groups did not differ before the introduction of the intervention, the researchers tested the following hypothesis: H_0 : There is no significant difference in pre-test performance in economics between students in the control and experimental groups.

The pre-test group statistics in table 3 indicates the mean score of 44.9630 for the control group and 46.5542 for the experimental group.

Table 3: Pre-test Group Statistics

	Class	N	Mean	Std. Deviation	Std. Error Mean
Pre-test scores	Control group	81	44.9630	10.67291	1.18588
	Experimental group	83	46.5542	10.27577	1.12791

Table 4: Pre-test Independent Sample t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Pretest score	Equal variances assumed	.022	.881	-.973	162	.332	-1.59125	1.63585	-4.82159	1.63909
	Equal variances not assumed			-.972	161.371	.332	-1.59125	1.63661	-4.82319	1.64068

Table 5: Pre-test Group Statistics

	Class	N	Mean	Std. Deviation	Std. Error Mean
Post-test score	Control group	81	51.2593	10.08189	1.12021
	Experimental group	83	80.7952	7.14955	.78477

In table 4, the Levene's test for equality of variance shows the Sig. of .881, leading us to the upper Sig of .332, which is greater than the critical value, meaning the pre-test score difference was not significant. The similarity in students' performance before the intervention makes it possible to generalize the findings of the study beyond the experimental setting because any changes in students' performance after the intervention results from the intervention. These findings align with prior studies by Gull and Shehzad (2015); Akanmu (2019) and Usman et al. (2018), which found no significant differences in pre-test achievement scores among control and experimental groups in economics.

Post-test Difference in Performance between the Control and the Experimental Groups

The researchers sought to establish whether a significant difference existed between economics students in the control group and those in the experimental group. The following null hypothesis was tested: H_0 : There is no significant difference in the post-test performance of economics students taught with cooperative learning strategies and those who were not taught with cooperative learning strategies.

The post-test group statistics in table 5 indicates the mean score of 51.2593 for the control group and 80.7952 for the experimental group.

Table 6: Pre-test Independent Sample t-test

		Levene's Test for Equality of Variances				t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Post test score	Equal variances assumed	6.210	.014	-21.682	162	.000	-29.53592	1.36220	-32.22589	-26.84595	
	Equal variances not assumed			-21.595	143.963	.000	-29.53592	1.36774	-32.23938	-26.83247	

Table 7: Paired Samples Statistics^a for the Experimental Group

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post-test score	80.7952	83	7.14955	.78477
	Pre-test score	46.5542	83	10.27577	1.12791

a. Class = Experimental group

Table 8: Paired Samples Test^a for the Experimental Group

		Paired Differences			95% Confidence Interval of the Difference			Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	
Pair 1	Post-test score - pre-test score	34.24096	7.32785	.80434	32.64088	35.84104	42.570	.000

a. Class = Experimental group

In table 6, the Levene's test for equality of variance shows the Sig. of .014, leading us to the lower Sig of .000, which is lesser than the critical value, meaning the post-test score difference was significant.

These results imply that using cooperative learning strategies significantly enhanced students' performance in national income accounting, determination and elasticity of demand topics in economics. These results suggest that the Jigsaw and think-pair-share methods, as cooperative teaching and learning strategies, are effective in improving the academic performance of economics students. Consequently, the alternative hypothesis that "there is a significant difference in the post-test performance of economics students taught with cooperative learning strategies and those not taught with cooperative learning strategies is retained.

This finding buttresses findings from previous studies on cooperative learning strategies like the Jigsaw and think-pair-share methods, which found that these cooperative learning methods enhance students' performance in economics (Usman et al., 2018; Akanmu, 2019) and mathematics (Hossain & Tarmizi, 2013). Thus, the study's finding suggests that senior high school economics teachers can employ both the Jigsaw and think-pair-share methods of cooperative learning to improve students' academic performance in senior high

school economics. This finding fits into Ivić and Vygotsky's (1934) sociocultural theory of cognitive development. Cooperative learning creates a conducive and supportive social learning environment where learners interact with more skilled or knowledgeable people to advance their learning. According to Johnson and Johnson (1999), cooperative learning promotes critical thinking, establishing a learning environment that inspires high-quality replies. It allows students to collaborate towards a common goal, deepening their understanding while contributing to the learning process in a supportive environment that allows for mistakes.

Difference in the Pre-test and Post-test Achievement scores of the Experimental Group

The following null hypothesis was tested: H_0 : There is no significant difference between the pre-test and post-test performance of economics students taught with cooperative learning strategies.

This hypothesis aimed to establish the impact of cooperative learning strategies on students' academic performance in economics using national income accounting and determination, as well as elasticity of demand. This was to ascertain whether students' academic performance would improve after using cooperative learning strategies to teach

them. Data analysis used a paired sample t-test, as presented in Table 7 and 8.

From Table 7, the mean difference between the two tests for academic performance was 34.24. This difference was significant due to the p-value of .000 in table 8. This indicates that the intervention, employing the Jigsaw and think-pair-share cooperative learning strategies, significantly improved the students' academic performance in economics. The alternate hypothesis was therefore, retained. Consequently, students' academic performance in the experimental group significantly improved using Jigsaw and think-pair-share teaching methods. This presupposes that the think-pair share and jigsaw methods are effective strategies for enhancing students' learning in economics.

The study's outcomes corroborate previous research findings that employed both the Jigsaw and think-pair-share models as cooperative learning strategies to improve students' academic performance in economics and mathematics. The results are consistent with the discovery of Usman et al. (2018) that there was a significant difference in students' achievement scores in economics, indicating that the use of the Jigsaw model significantly improved the results of the experimental group of students.

Similarly, these findings align with Gull and Shehzad's (2015) study, which found a significant difference in pre-test and post-test economics achievement scores. Therefore, implementing cooperative learning strategies to teach senior high school economics improves students' academic performance. As already established, the Jigsaw and think-pair-share models are among the cooperative learning strategies suitable for the teaching and learning of economics (Marburger, 2005; Sahin, 2010). Melihan and Sirri (2011) obtained similar findings and concluded that cooperative learning is superior to traditional methods for raising academic achievement. Research by Gillies (2006); Hennessy and Evans (2006), Johnson et al. (2000) and Bukunola (2012) support these findings. Economics educators must therefore endeavor to implement such cooperative learning strategies to improve students' academic performance.

Conclusions and Recommendations

Based on the findings, the study concludes that senior high school economics students' positive perception of the use of cooperative learning strategies suggests that teachers can embrace the

use of the cooperative learning strategies for effective learning of senior high school economics. Therefore, the study recommends that senior high school economics teachers incorporate cooperative learning strategies in teaching the subject.

The fact that economics students in the experimental and control groups had the same level of poor performance in economics before teaching them with cooperative learning strategies points to a serious problem with students learning of those concepts. This requires the urgent attention of the Ghana Education Service and other stakeholders, such as economics teachers and institutions that train economics teachers. The researchers recommend that stakeholders in economics education carry out larger-scale research to unravel other issues that may account for students' learning challenges in senior high school economics.

The significant difference in the post-test performance of senior economics students in the control and experimental groups, as well as the improved post-test performance after teaching them with cooperative learning strategies, point to the potency of using cooperative learning strategies for teaching national income accounting and determination, and elasticity of demand at the senior high school level. Therefore, the researchers recommend that Ghana Education Service support economics teachers through continuous professional development so that the teachers can effectively employ cooperative learning strategies to improve students' performance in senior high school economics.

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