

Effect of Cooperative Learning on Students' Performance in Mathematical Based Topics in Economics Curriculum at SSS Level in Lagos State, Nigeria

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Abstract

Cooperative learning strategy is an effective instructional tool that can enhance the teaching and learning of Economics in Senior secondary schools. However, most Economics researchers, scholars and teachers are yet to be abreast with the use of this Cooperative learning strategy for teaching and learning of Economics. The study examined the effect of cooperative learning strategy on Economics students' academic achievement at the Senior Secondary School (SSS) level in Lagos State, Nigeria. Three research objectives and three research questions were raised and answered while two null hypotheses were generated and tested using t- test tool at 0.05 level of significance. The research designs employed in this study were descriptive survey and quasi-experimental; specifically, pretest, post-test, non-equivalent control group design. The stratified random sampling technique was used to select two hundred and forty (240) Senior Secondary two (SS2) students from six public senior secondary schools in two education districts of Lagos State, Nigeria. An instrument known as the Economics Achievement Test (EAT) with a reliability coefficient of 0.83 was adopted and duly validated by experts. Mean and standard deviation was used as a pre-test and a post-test to measure the achievement and to collect data easily. In the experimental groups, a cooperative learning strategy was used to answer the research questions, while simple regression and t-test analysis was used to test the hypotheses at a 0.05 level of significance. The results revealed that students taught using cooperative learning strategy perform better in the Economics Achievement Test than those taught using lecture methods of instruction. Thus, there was a significant effect in the use of cooperative learning strategy on the teaching and learning of Economics. Also, there was no interaction between methods, and gender on students' Economics Achievement Test. The study concluded that there is a need for the use of cooperative learning strategies for effective teaching and learning of Economics in order to improve the teaching effectiveness and academic performance of students at senior secondary schools. Based on these findings and conclusion, it was recommended amongst others that Economics teachers should be encouraged to use cooperative learning strategy as an effective learning strategy to teach Economics because it improves students' performance, enhances social interaction skills and fosters meta-cognition in students.

Keywords: *Cooperative Learning strategy, Lecture Methods, Economics Curriculum, Academic Achievement, Public, Senior Secondary Schools, Teaching Effectiveness*

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Background to the Study

Globally, social science education has focused on preparing individuals with appropriate skills, abilities, and competencies both mental and physical to live and contribute to the development of society. Economics education as an integral part of social sciences education has been accepted as a determinant of national development in modern societies because it enables students to understand their roles in their economic system, as consumers, citizens, and future employees or employers. It also prepares and encourages students to be prudent and effective in the management of scarce resources and enables them to acquire knowledge for the practical solution to the economic problems of society. To achieve creativity and overall national development, a teaching strategy that captures the interest of secondary school students in economic concepts is imperative according to Adu (2012). Economics is one of the social science subjects expected to be studied at the senior secondary school (SSS) level under the new National Policy on Education (Federal Government of Nigeria, 2013).

The study of Economics serves a useful purpose in modern life. It gives facts and shows what may be expected to be the outcome of certain lines of conduct; helps to decide which of several alternatives to choose. Economics helps in making wise choices that will satisfy needs in the presence of unlimited wants and limited resources (Adu, 2014). Economics education is vital to the future health of our nation's economy. It gives our students the building blocks for a successful financial future. It empowers consumers by giving them the knowledge and tools to improve their economic wellbeing. It is the best investment that can strengthen a nation's economy.

Despite the importance of Economics to individuals and national development as well as an increase in the number of senior secondary school students that are offering the subject, Nigerian students' performance in Economics at the SSCE level has been fluctuating since the introduction of a new Economics syllabus which incorporated some elements of Mathematics into the subject according to Adu and Ayeni (2013). This is because Economics has most of its concepts in quantitative and graphic relationships which cannot be understood without the application of mathematics. Hence, Mathematics is fundamental in studying Economics as it helps in the systematic understanding of the relationship and in the derivation of certain economic results which would either be impossible through verbal argument, or would involve complex, tedious, and difficult processes. Supporting this, Osafehimi (2016), asserts that the learning of Economics and Mathematics together in schools is germane, as Economics is the most mathematical of all the social sciences. However, Mazzi (2009), pointed out some problems that cause students' poor performance as, "short supply of qualified teachers of Economics, poor teaching method, insufficient use of instructional materials in teaching Economics, and attitude of students towards the teacher and administrators in teaching and learning". His previous research findings had shown that students' academic performance is affected by different factors such as learning abilities, race, gender and sex.

The Chief Examiner's Report on Economics for May/June 2019 West African Senior Secondary Certificate Examination (WASSCE) confirmed that the standard of the paper was

at par with those of previous years. The rubrics were clearly stated, and the questions were devoid of any ambiguity. The marking scheme was comprehensive, and marks were well distributed. However, there was a slight drop in candidates' performance when compared to those of previous years. A cursory look at the performance of the students in Economics during the period of 2016 to 2019 revealed this (see table 1 below). Considering the relevance attached to the study of Economics concerning its contributions to national development, the fluctuating performance is not encouraging.

Table 1: Statistics of Performance of Candidates in May/June WASSCE in Economics (2016 – 2019)

Year	Total	Credit (1 - 6)	Pass (7 -8)	Fail (9)
2016	1540902 (97.29%)	864273 (56.09%)	409468 (26.57%)	232321 (15.08%)
2017	1532194 (97.72%)	1025703 (66.94%)	310963 (20.30%)	159927 (10.44%)
2018	1363994 (98.05%)	698669 (51.22%)	336624 (24.68%)	302462 (22.17%)
2019	1175348 (98.01%)	511007 (43.47%)	329396 (28.02%)	309757 (26.35%)

Source: WASSCE (2020). Available on <http://waec.org/index.pp/economic>.

The statistics in table 1 highlights the fluctuating performance level of candidates in Economics in the West African Senior School Certificate Examination (WASSCE) between 2016 and 2019.

Looking at the Chief Examiner's Report, two (2) major candidates' weaknesses were pointed out, (i) poor graphical analysis, and (ii) failure to solve mathematical-based questions. This fluctuating performance of students could be linked to many factors, but the most significant for this study is the instructional methods employed by teachers. There are many instructional methods of teaching Economics which are: cooperative learning, inquiry-based learning, a problem-solving method, discussion method, role-play method, lecture method, case-study method, etc. The researcher has chosen to adopt the Cooperative Learning and Lecture method for this study because they are student-centered and teacher-centered methods, respectively.

Cooperative learning strategy is a student-centered teaching method in which students work together in a small heterogeneous group of 4-5 to complete a problem, project, or any other instructional goal, while teachers act as a guide or facilitator, mediator, and assessor of learning. Heterogeneity in the grouping can be achieved by combining students of different sexes, academic ability levels, ages, religions among others so that students can get beyond their initial stereotypes and be able to treat each other as colleagues (Igboanugo,2013). This method is characterized by the following: Learners positively depend on each other, engage in face-to-face interaction, are assessed individually, and held accountable for equally contributing to the mastery of learning goals, develop appropriate cooperative and interpersonal skills to teach and encourage each other to learn and reflect and assess the effectiveness of growing, for future learning (Johnson and Johnson 1999, Kagan 1994). This method is superior in developing students' abilities in applying concepts and personal growth,

developing positive attitudes, fostering motivation, and encouraging appropriate group social skills as well develop the skills necessary to work on projects too difficult, tedious, and complex for anyone to do in a reasonable amount of time. Also, group rewards and individual accountability within the group are essential. However, since Cooperative Learning is student-centered, it gives both male and female students the leverage to contribute immensely to the class which in return, could enhance their academic performance.

The lecture method is a teaching procedure in which there is a one-way channel of communication where the teacher presents a verbal discourse on a particular subject, theme, or concept to the learners, the teacher delivers pre planned lessons to the students with little or no instructional aides and students react by silently listening and taking notes - Nwagbo and Chikelu (2011). This method is good for large classes since much work could be easily covered in a shorter time. Idris and Rajuddin (2012) in their study, observed that the lecture method is a common practice in Nigeria where a teacher stands before the chalk/ ink board and delivers a lesson through verbal instruction while the students serve as passive listeners and take notes from the board. This teacher-centered method is predominant in most classrooms and does not stimulate students' innovation, inquiry, and creative thinking but rather encourages students to memorize facts that are easily forgotten.

Thus, economics teachers need to employ different teaching/learning methods and strategies that are student-centered which will enable the learner to construct his/her understanding of concepts through practices mostly in mathematical-based topics rather than mere listening. Such strategies include cooperative learning, team-based learning, problem-based learning, collaborative learning, peer-assisted learning, active learning, etc. These strategies have their roots in constructivism.

However, despite the potential gains of cooperative learning, it is not widely practiced in Economics, and it appears that little or no study has been carried out to address the matter really and methodically in Lagos, Nigeria. It is against this background that the researcher intends to fill this knowledge gap and contribute to the body of knowledge on cooperative learning strategy by determining the effect of cooperative learning strategy (CLS) on Economics students' academic performance in mathematical based topics at senior secondary school (SSS) level in Lagos State Nigeria. Thus, the researcher is more interested in the mathematical-based topics because Economics has most of its concepts in the quantitative and graphic relationship which cannot be understood without the application of mathematics.

Statement of the Problem

Despite the importance of Economics to individuals and national development as well as an increase in the number of senior secondary school students that are offering the subject, there is prevailing poor academic performance of Economics student's year in year out in external examinations in Economics at the SSCE level since the introduction of a new Economics syllabus which incorporated some elements of Mathematics into the subject according to Adu and Ayeni (2013). This has become worrisome to teachers, parents and educational stakeholders in the society. This suggests that the strategies employed by teachers in teaching

the subject may be inappropriate, wrong or ineffective as a result, many students lost interest in the subject (Uzomah,2006). Again, many Economics teachers at secondary school level are not aware of the use of cooperative learning strategy of instructional delivery of the subject in the classrooms., hence they constantly apply the traditional lecture methods in teaching the subject in secondary schools.

These traditional lecture methods do not give the students in-depth knowledge of the subject to enable them to apply the lessons to real-life situations. And also make students to be passive learners who merely listen, read, and memorize the concepts to pass the examination. Therefore, there is an urgent and compelling need for total paradigm shift from the use of traditional lecture methods to the use of cooperative learning strategy which teachers and students can use to achieve an effective and result oriented teaching and learning of Economics in Lagos State senior secondary schools. Hence, this study is set to examine the effects of cooperative learning on students' Economics achievement at the SSS level in Lagos state, Nigeria.

Purpose of the Study

The purpose of this study is to determine the effect of cooperative learning instructional strategy on students' performance in economics. Specifically, the study sought to:

1. Determine the differential effects of cooperative learning instructional strategy and traditional lecture method on students' performance in economics.
2. Determine the effect of cooperative instructional strategy on male and female students in Economics Achievement Test
3. Determine the Inter Action effect of method and gender on the mean achievement scores of SSII students in economics

Research Questions

The following research questions guided the study

1. What is the effect of cooperative learning strategy on the mean achievement scores of SSII students in economics when compared with the and traditional lecture method?
2. What is the effect of cooperative learning strategy on the mean achievement scores of male and female SSII students in economics when compared with the traditional lecture method?
3. What is the interaction effect of method and gender on students' mean achievement in economics when compared with the tradition method?

Research Hypotheses

Based on the research questions, the following null hypotheses were generated and tested at 5% alpha level (i.e. $\alpha = 0.05$):

H01: There exists no statistically significant effect on the mean achievement scores of SSII students taught economics with cooperative learning strategy and those that are exposed to the traditional lecture method.

Q: There is no significant effect of cooperative learning strategy on the mean achievement scores of males and female SSII students in economics

Concept of Cooperative Learning Strategy (CLS)

Cooperative learning strategy has been described as one of the most remarkable and fertile areas of theory, research, and practice in education (Johnson, Johnson and Stanne, 2014). Cooperative learning exists when students work together to accomplish a shared goal (Johnson and Johnson, 1987). It is an instructional strategy in which a small group of students works together to accomplish a shared goal (Johnson, Johnson and Smith, 2004). Students perceive that they can reach their learning goals if and only if the other group members also reach their goals. In a cooperative learning strategy, the teacher assigns the students to a group of four to five members to achieve academic and social tasks. Slavin (1989), described cooperative learning as a set of alternatives to traditional instruction. As an alternative to the traditional teaching method, cooperative learning is a successful instructional strategy that encourages the learners in a small group, each with students of different levels of ability, to work cooperatively and jointly in a non-competitive environment to obtain their learning goal. All teaching methods are based on models of teaching. Cooperative learning strategy is rooted in the social family of teaching models which emphasize the central role of students' interaction and active role in enhancing understanding. The term cooperative learning, according to Slavin (2011), refers to a variety of instructional strategies in which teachers encourage students to cooperate in learning. A cooperative learning strategy can be seen as an instructional strategy that encourages interactive learning in which students, in a small group, cooperatively construct new knowledge.

Basic Elements of Cooperative Learning Strategy

The basic elements as identified by researchers such as Johnson and Johnson (1987) and Erinosh (2008) are:

1. **The Positive interdependence:** This is where Students must perceive that they —sink or swim together. This might be achieved through mutual goals (goal interdependence); division of labor (task interdependence); dividing materials, resources, or information among group members (resource interdependence); assigning students differing roles (role interdependence); and by giving joint rewards (reward interdependence). Students develop the spirit of —we and enjoy the benefit of sharing information (Erinosh, 2008).
2. **Face-to-face interaction:** This allows students to interact with themselves, share their knowledge as a team, and support one another to learn (Erinosh, 2008). It is the interaction patterns and verbal interchange among students promoted by positive interdependence that affect educational outcomes.
3. **Individual accountability:** This reveals that every group member is responsible for learning the material. Since everyone's work contributes to the group work and is taken into account in the assessment, the success of the cooperative learning strategy depends upon individual and group accountability.
4. **Social skills/interpersonal small group skills.** For cooperative learning to be successful students must be taught the social skills needed for collaboration and they must be motivated to use them as disagreement and conflict in any group is inevitable. Social skills of conflict resolution trust-building, leadership, respect, peaceful coexistence, and friendship are important in helping a group to achieve and maintain effective

- working relationships within the group. The skills must be taught just as purposely and precisely as academic skills (Smith, Sheppard, Johnson and Johnson, 2005).
5. The fifth and final element of CLS is group processing. According to Seifert (1991), group processing can be seen as reflecting on a group session to (a) describe which members' actions were helpful and unhelpful, and (b) decide about which action to continue or change. He further stated that the purposes of group processing are to clarify and improve the effectiveness of the members in contributing to the collaborative effort to learn. How well the group is functioning and how can the group's effectiveness be improved are questions solely about group processing.

The basic elements highlighted above provide a framework against which teachers should implement CLS in their classrooms to allow students to participate fully in the teaching-learning process. Cooperative learning is one of the most versatile and researched interactive learning strategies.

Theoretical Framework

The Cognitive-Developmental Theory

The cognitive-developmental theory is grounded in the work of Jean Piaget (1964) and Lev Vygotsky (1978); Jean Piaget (1964) is a personal constructivist whose perspective views interaction as stimulating cognitive conflict. To him, stimulating cognition is a catalyst for change and challenges individuals to reconsider understandings and construct new ones. The aim of learning cooperatively for Piaget, therefore, is to accelerate an individual's intellectual development by producing a consensus with other students. In cooperative learning situations, the key concepts involved in Piaget's theory include schemas, assimilation, accommodation, and equilibration. A schema describes both the mental and physical actions involved in a learner's understanding and acquisition of knowledge. As experiences happen, this new information is used to modify, add to or change previously existing schemas. Assimilation is the process of integrating or taking in new information into the learner's existing schema or internal structures. Accommodation involves altering existing schemas or ideas because of new information or new experiences. In cooperative learning, as learners come across new information or experience in their learning teams, they may develop new schemas or alter their previously existing schemas. While equilibration is a mechanism through which learners try to strike a balance between assimilation and accommodation.

Vygotsky (1978), and other related social constructivists proposed that knowledge is socially constructed from cooperative efforts to learn. According to this perspective, more capable peers and adults scaffold or mediate the learning using language and a range of supportive strategies. The fundamental concept in Vygotsky's theory is the zone of proximal development (ZPD). This zone is the difference between what a child can do alone and what he/she can do with others' assistance. Thus, the child does not learn in isolation therefore the teacher should create room for cooperation amongst students for effective cross-fertilization of ideas and knowledge.

Relevance to the Study: This theory is relevant to the study because it best explained the basic tenets of cooperative learning strategy which include learning through interaction among learners and active involvement of students in their learning. (i.e., an 'all for one – one for all' attitude is required). Therefore, this supports a student-centered teaching method (learning cooperatively) as it accelerates an individual's intellectual development by producing a consensus with other students to improve academic performance.

The Social Interdependence Theory: The social interdependence theory propounded by Kurt Lewin in 1948 and developed by Morton Deutsch in 1962 is based on the claim by social scientists that peer interaction and relationships play an essential role in socialization and learning (Johnson & Johnson, 2009: 367-374). It provides the framework for understanding the role of positive interdependence among group members in promoting learning. The social interdependence theory thrust is that the way social interdependence is structured determines how individuals interact, and this, in turn, determines outcomes.

Relevance to the study: The social interdependence theory supports the use of cooperative learning as it emphasizes positive interdependence or cooperation which encourages and motivates group members to facilitate each other's efforts to learn. This in turn helps the group to achieve their learning goal.

Methodology

The research designs employed in this study were descriptive survey and quasi-experimental; specifically, pretest, post-test, non-equivalent control group design. The stratified random sampling technique was used to select two hundred and forty (240) Senior Secondary two (SS2) students from six public senior secondary schools in two education districts of Lagos State, Nigeria. An instrument known as the Economics Achievement Test (EAT) with a reliability coefficient of 0.83 was adopted and duly validated by experts. Mean and standard deviation was used as a pre-test and a post-test to measure the achievement and to collect data easily. In the experimental groups, a cooperative learning strategy was used to answer the research questions, while simple regression and t-test analysis was used to test the hypotheses at a 0.05 level of significance. Economics Achievement Test (EAT), and Teachers' Assessment Questionnaire (TAQ), and Students' Response Questionnaire (SRQ) were the instruments used for data collection.

Methods of Data Analysis

Since this study is quantitative, both descriptive and inferential statistics were employed for data analysis. The data generated through the questionnaires were presented in a tabular form. The respondents' responses from strongly agree to strongly disagree were coded as 4, agree - 3, disagree - 2, and strongly disagree - 1. This made it easy to analyze the respondents' responses in frequency; the percentage and the mean value of these responses were calculated. The independent samples t-test was used to test the five null hypotheses formulated for the study at 0.05 significant levels on whether to accept after being tested. A t-test was used when dealing with the means because of its superior power to detect differences between two means.

Analysis of Research Questions and Test of the Research Hypotheses.

The results obtained from the analysis of data were used to answer the research questions raised and the hypotheses formulated.

Research Question 1: How appropriate is the use of instructional cooperative learning strategy to the teaching of each of the 5 identified mathematical-based topics in Economics?

Table 2: Table of the results of students' response to Students' Response Questionnaire for small group validation for cooperative learning instructional strategy.

S/N	Statement	SA	A	D	SD	Mean
1	The instruction using cooperative learning is an effective method to learn economics	10	12	2	6	2.9
2	The (STAD)cooperative learning strategy encourages students to foster interpersonal competence.	4	16	4	6	2.6
3	The (STAD)cooperative learning strategy is a student centred method of learning.	6	14	8	2	2.8
4	The strategy helps us to brainstorm ideas on mathematical-based topics in economics.	6	12	8	4	2.7
5	This strategy specifies roles students should play individually in the group.	4	18	2	6	2.7
6	A cooperative learning strategy provides an opportunity for students to interact as they work together in teams.	10	16	4	0	3.2
7	The instruction using the cooperative learning strategy held my attention more than the method my teacher use to teach me.	6	16	2	6	2.8
8	The guidelines on how to apply the learning strategy are easy to understand.	10	12	2	6	2.9
9	Cooperative learning strategy has effective casual effect on student's academic performance.	4	18	4	4	2.7
10	It helps to create a possible environment where teachers build positive relationships among students as facilitators.	8	14	0	8	2.7
	TOTAL	68	146	36	48	2.77

Source: Researchers Field Survey, 2019

Validation with Students

This was carried out in two stages – small group validation (involving 30 students for the treatment group) and field testing (which involves all the students in the treatment group).

After the cooperative learning strategy (STAD) was used to teach in the experimental group, a 10 item Students' Response Questionnaire (SRQ) was administered to thirty (30) students of the group. The result obtained from their responses is shown on the table above and analyzed accordingly using mean scores(\bar{x}) of the questionnaire items. A mean less than 2.5 imply disagreed($\bar{x} < 2.5 \Rightarrow$ disagreed), while a mean greater than or equal to 2.5 implies agreed ($\bar{x} \geq 2.5 \Rightarrow$ agreed).

Table 2 shows that all the mean scores of the items are greater than 2.5($\bar{x} > 2.5$), which indicates that the students agreed with the items. The implication is that most of the respondents rated the cooperative learning instructional plan valid and appropriate for teaching the selected

topics in economics. From the free comments of the students about what they liked to be improved in the strategy, some of them indicated that they would like cooperative learning to be used for other topics in Economics and even in other subjects.

Research Question 1: What is the effect of cooperative learning instructional strategy and lecture method on economics achievement tests?

Table 3: Independent-sample t-test comparing mean achievement scores of students taught with Cooperative Learning Strategy and those taught using Lecture method in Economics.

Treatment	Number	Pretest		Post-test		Mean gain
		Mean	STD	Mean	STD	
Cooperative Learning Strategy (Exp.)	120	15.73	4.76	35.49	6.03	19.96
Lecture method (Control)	120	15.84	4.72	33.93	5.96	18.09
Differences		-0.11	0.04	1.56	0.07	1.87

Source: Researchers Field Survey, 2019

The data in above table 3 showed that the two groups were originally at almost the same level of achievement with a pretest mean achievement score of 15.73 and standard deviation of 4.76 for the experimental group and a pretest mean achievement score of 15.84 and standard deviation of 4.72 for the control group. The little difference in the mean and standard deviation of -0.11 and 0.04 respectively shows that both groups were at the equivalent level of achievement. For the posttest, the experimental group obtained a slightly higher mean achievement score of 35.49 with a standard deviation of 6.03. The control group obtained a mean achievement score of 33.93 with a standard deviation of 5.96. The difference in the posttest means and standard deviation scores for the two groups were 1.56 and 0.07 respectively.

This signifies that the experimental group had some level of improvement because of exposure to cooperative learning strategy. The standard deviation is indicative of wide variability between the scores of the groups.

Research Question 4: What is the differential effect of cooperative learning instructional strategy on single sexed school and mixed sexed school student's economics' achievement?

This question was answered using experimental group mean performance after exposure to cooperative learning strategy based on school type difference as follows:

Table 4: Post-test mean achievement scores of single sexed school and mixed school students taught economics using cooperative learning strategy in the experimental group

Variable/School Type	N	Post-test	
		Mean	Standard Deviation
(Boys only and Girls only school students)	80	20.88	4.36
Mixed school students	40	21.02	4.44

Source: Researchers Field Survey, 2019.

Table 4 shows the mean performance of students in both single and mixed public schools in the experimental group. The mean performance of the single sexed school students was 20.88, while the mixed school students had 21.02. This showed a very mild mean difference of 0.14 after exposure to cooperative learning strategy, implying that there is no gain attributable to school type difference. The standard deviation of 4.36 for single-sex schools and 4.44 for mixed schools is indicative of wide variability between the scores of the group.

Inferential Analysis on the stated null Hypotheses

The two (2) formulated research hypotheses were tested to establish the significant relationship between the variables using t-test statistics at 0.05 significant levels.

Ho₁: There is no significant relationship between cooperative learning and students' economic achievement

Table 5: Pre-test and Posttest achievement mean scores of the experimental and the control groups

Group	N	Pre-test					Post-test				
		Mean	Std	t-value	Df	p-value	Mean	Std	t-value	Df	p-value
Experimental	120	46.34	10.92	-	238	0.281	66.18	11.19	-	238	0.031
Control	120	47.68	11.18	1.086			50.18	11.03	2.189		

Source: Field Survey 2019; analyzed with SPSS 21.0

Table 5 above shows the pre and post-test scores of the experimental and the control group. The pre-test results indicate that the mean score for the experimental group was 46.34 with a standard deviation of 10.92 and that of the control group was 47.68 with a standard deviation of 11.18. The results also indicate that the difference between the achievement mean scores for experimental and control group $t(238) = 0.281$ is not significant at the alpha level of 0.05. This, therefore, means that the experimental and control groups were at the same level of achievement at the start of the study. Hence, the post-test achievement means results indicate that the mean score for the experimental group was 66.18 and that of the control group was 50.18. The results also indicate that the difference between the achievement mean scores for experimental and control group $t(238) = 0.031$ is significant at the alpha level of 0.05. Hence, the null hypothesis which stated that "There is no significant relationship between cooperative learning and students' economics achievement" is rejected.

Ho₂: There is no significant difference between the academic performance of students in a single school and those in mixed schools taught using the Cooperative Learning Strategy.

Table 6: T-test analysis of the significant difference between the performances of single-sex school and mixed school students exposed to cooperative learning strategy.

Variable	N	t-cal.	df	α	t-crit	Decision
Single-sex School	80	2.11	118	0.05	1.65	Significant
Mixed School	40					

Table 6 showed the calculated t-test as 2.11 at $\alpha = 0.05$ with $df = 118$ and $t\text{-critical} = 1.65$. This shows the t-calculated (2.11) was greater than the t-critical (1.65). This indicates that there was a mild difference between the academic performance of the single-sex school and mixed school students taught Economics with Cooperative Learning Strategy in senior secondary schools in Lagos state. Hence, hypothesis four which stated that there is no significant difference between the academic performance of single-sex school students and mixed school students taught Economics with Cooperative Learning Strategy in senior secondary schools in Lagos state is accepted. Thus, the null hypothesis statement was retained not rejected at the 0.05 level of significance

Summary of Findings

Here are the highlights of the findings

The understanding of students taught mathematical-based topics in Economics with cooperative learning strategy and conventional lecture method differs significantly. Outcomes of the study showed that cooperative learning can be used as alternative pedagogy in a conventional classroom for achieving quality education to all types of learners and encourage social science learning in females. Therefore, CLS promotes learning of all types of students to learn better and faster from their peer group, than from a teacher irrespective of their gender.

Discussion of Findings

Relationship between post-test scores in economics achievement test among participants exposed to the experimental conditions. The findings from the study revealed that there is a difference between the post-tests in Economics among participants exposed to Cooperative learning. This finding was derived from the testing of hypothesis two which stated that there is no significant difference in the post-test scores in economics achievement test among participants exposed to the experimental conditions. From the analysis, it was discovered that Cooperative Learning was better in improving student performance in Economics than those in the Control group. This implies that the Control group had lower post-test scores in Economics than students exposed to Cooperative Learning. This aligns with the study of Recesso and Orrill (2018) that teachers in a cooperative-Based Learning environment help students identify real questions and refine them into learning projects or opportunities. In addition, the finding agrees with Recesso and Orrill (2018) that by engaging in inquiries, students increase their understanding of the subject matter, investigate, and develop the knowledge and skills needed to answer questions and investigate for greater understanding. In the same vein, the study agreed with Shane and Wojnowski (2015), assertion that students

learn best when they construct their knowledge based on multiple experiences with a concept or skill. Furthermore, the study agrees with Bandura (1994) who opined that Cooperative Learning structures in which students work together and help one another also tend to promote more positive self-evaluations of capability and higher academic attainments than individualistic or competitive ones. Furthermore, it agreed with Ward (2001) that cooperative Learning helped in building on previously constructed knowledge; students can better grasp the concepts and can move from simply knowing the material to understanding it.

The experimental group demonstrated significant progress in students' academic achievement towards Economics in contrast to the control group. The result proposes that the increase of the students' achievement in Economics post-test mean scores for the experimental group was owing to the momentous effects of cooperative learning. The teacher must be conversant with instructional skills in the up-to-date Economics teaching situation. Consequently, schools should set up a workshop for pedagogical interactions to consult each other to share teaching experiences to express their problems and to brainstorm instructional strategies to endorse teachers' professional development. Teachers are organizers, facilitators, and evaluators so to get rid of the problems amongst cooperative learning and traditional teaching strategies the Economics teachers' task should be an adaptation of proper teaching method. To sum up, the teachers who are eager to implement the new ideal strategies in our global society should be equipped, patient, skilful, flexible, and perseverant through lots of practice and trials and to reach teaching goals in the current society.

Conclusion

The following conclusions were drawn in the light of statistical analysis and the findings of the study:

Different studies have revealed that many methods of cooperative learning have been developed and tested. The CLS appears to have a strong record of successes in increasing student's motivation to learn and enhancing higher academic performance. Students exposed to CLS in the present study performed significantly better than those taught economics utilizing the traditional lecture method. The strategy can be used to address the present trend of poor academic performance of senior secondary school students in economics. Economics teachers at the senior secondary level can explore the potential of CLS to improve the teaching and learning of economics irrespective of the major area of the subject.

The literature indicated that cooperative learning is characterized by positive interdependence, individual accountability, face-to-face interaction, interpersonal and small group social skills, and group processing. However, the study revealed that there are gaps identified in teaching mathematical-based topics in economics using the traditional method only. Significant differences in students' academic achievement towards Economics were found between control and experimental groups. Subsequently, the treatment was over, experimental group students exhibited significant development in achievement towards Economics in contrast to control group students. Based on the finding, it is therefore concluded that a cooperative learning strategy enhances achievement by helping students comprehend properly since they are given the room to learn independently. Also, teachers in

schools, especially teachers who teach economics need to be aware of the benefits and importance of cooperative learning and thus make a paradigmatic shift in their thinking, attitude, and belief, changing the practice of teacher-centered teaching methods to student-centered teaching methods as an alternative.

Recommendations

Based on the finding, the following recommendations were made:

- i. There is a need to engage students in the teaching and learning process to help them increase their understanding of the subject. They should not merely know what the teacher says but should have a better grasp of the concepts. This will have a high impact on students' performance in Economics.
- ii. The students should be encouraged to believe that their actions produce the outcomes they desire and to persevere in the face of obstacles or adverse circumstances.
- iii. There is a need for students to relate to the learning materials. This will improve performance in Economics.
- iv. Frequent and regular use of cooperative learning would help students to learn many life skills and share common goals which allow them to learn to trust each other as they achieve more than would be possible on their own.
- v. Consequently, schools should set up a workshop for pedagogical interactions to consult each other, share teaching experiences, express their problems, and brainstorm instructional techniques to endorse teachers' professional development.

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