IMPROVING SECONDARY SCHOOL STUDENTS ACHIEVEMENT IN COMPUTER STUDIES THROUGH THINK PAIR SHARE LEARNING STRATEGY

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Abstract: *Following the numerous importance of think-pair-share learning strategy as an innovative learning strategy that has helped students achievement in various subjects and Basic Education Certification Examination (BECE) Chief Examiner's report on students' weaknesses in Computer Studies concepts of internet, operating system, search engine, graphic package, corel draw, paint environment, spreadsheet package, computer safety, measure and computer software among upper basic students in Anambra state. This study examined improving secondary school students' achievement in computer studies through think pair share learning strategy. Two purpose of study, two research questions and two hypotheses guided the study. The study was carried out in Otuocha education zone in Anambra State, Nigeria. The population of the study consisted of 6,982 JSS2 students' in the zone. The study adopted quasi experimental design. The sample comprise 393 JSS2 students' (169 males and 224 females) and was obtained using a multi-stage sampling procedure. 50 Computer Studies Achievement Test (CSAT) served as instrument for data collection for both post and retention test respectively. The instrument was subjected to content validation. CSAT reliability was established using Kudar*

Richardson 20 (KR-20) which yielded reliability coefficient of 0.70. Mean and Standard Deviation were used to answer the research questions while analysis of covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. The findings of the study revealed that students taught Computer Studies with TPS learning strategy achieved more than those taught Computer Studies with LM. Thus there is a significant difference in the mean achievement scores of students taught Computer Studies using think-pair-share learning strategy and those taught using lecture method. The study also showed that male students taught Computer Studies with TPS achieved better than their female counterpart, thus there is a significant difference in the mean achievement scores of male and female students taught Computer Studies using think-pair-share learning strategy. Based on these findings suggestions and conclusions were made.

Keywords: *computer studies; think-pair-share; learning strategy.*

Introduction

Computer Studies is the academic discipline that explores the principles, applications, and development of computer systems and software. It encompasses programming, algorithms, hardware, networking, and information systems, equipping learners with skills to understand and innovate in the digital world generally.

However, the objectives of Computer Studies at the junior secondary school level of education by Federal Ministry of Education (FME, 2019) is to enable the learner to: Acquire basic computer skills such as the use of the keyboard, mouse and system, use the computer to facilitate learning electronically; develop reasonable level of competence on ICT applications that will engender entrepreneurial skills. Despite these objectives behind the establishment of Computer Studies in junior secondary school, the examination body that is in charge of junior secondary external exams known Basic Education Certification Examination (BECE) still asserted poor reports in achievement in the subject.

Basic Education Certification Examination (BECE) Chief Examiner (2019-2023) reported that the rate of credit level in Computer Studies are poor due to the use of wrong teaching method. The report also has it that the poor achievement came as a result of weaknesses by students in these areas of Computer Studies namely internet, operating system, search engine, graphic package, corel draw, paint environment,

spreadsheet package, computer safety and measure and computer software. Oribhabor (2020) asserted that BECE Chief Examiners' report (2019) confirmed that students' poor achievement in Computer Studies come as a result of weaknesses in the areas of ICT gadget, computer virus, database, worksheet, search engines, computer problem solving skill, internet and spreadsheet package. Similarly, BECE Chief Examiners' Report (2019-2023) summarily attributed the poor achievement of students in Computer Studies concepts of Computer Virus, Search Engine, Spreadsheet Packages and Spreadsheet features and terminologies to lack of qualified teachers to handle the Computer Studies concepts in the classroom and poor instructional strategies used in presenting the technical and practical content areas of the subject to students in the computer base classroom/laboratory. Based on the above weaknesses which has become a thing of worry to stake holders in education, what could be cause of these weakness?

Iniobong (2018) observed that poor instructional strategy could be a hindrance and cause of weaknesses to academic achievement of Computer Studies concepts in Computer Virus, Search Engine, Spreadsheet Packages and Spreadsheet features and terminologies to humanity and its environs. Despite the uniqueness of Computer Studies especially in the subject concept of Computer Virus, Search Engine, Spreadsheet Packages and Spreadsheet features and terminologies in secondary schools, students' achievement in the subject has been consistently poor in external examinations (Iniobong, 2018; Oribhabor, 2020). For the purpose of this study think pair share learning strategy was examined.

Think-Pair-Share (TPS) is a collaborative, student-centered strategy where students think individually, then discuss with a partner, and finally share with the class. It enhances academic achievement, social skills, vocabulary, and critical thinking. TPS actively involves students, promotes meaningful learning, teamwork, communication, and motivation. Research shows it improves retention and achievement in subjects like science and computer studies. This method fosters a comfortable environment for learners, builds knowledge collaboratively, and reduces boredom associated with traditional lecture methods, making learning more engaging and effective.

In a study by Okekeokosisi and Okigbo (2019) who investigated on effect of think-pair-share instructional strategy (THPSIS) and gender on secondary school students' achievement in Computer Studies in Delta state Nigeria. The authors revealed that there is a significant difference in the mean achievement scores of students exposed to THPSIS and conventional group in favour of former group but there

was no significant difference in the mean achievement scores of male and female students exposed to THPSIS. Similarly, Omeje (2024) reported that students who were taught acid-base reactions using think-pair-share instructional strategy had improved academic achievement than their counterparts who were taught using lecture method. It was also found that male students had improved academic achievement than their female counterparts when exposed to think-pair- share instructional strategy in Enugu State, Nigeria.

Furthermore, Emmanuel et. al. (2022) revealed that there is no significant difference in the mean performance scores of students with varied learning styles taught Physics using Think-Pair-Share learning strategy. The authors further observed that a significant differences existed in the mean performance scores of both male and female students with varied learning styles who are taught Physics using Think-Pair-Share learning strategy in Benue State, Nigeria. Also, Abiodun et. al. (2022) revealed that there is the main effect of the strategy on the student's achievement in Mathematics in use of TPS. Also, it was established from the author that there is no significant main effect of gender on the achievement of the students in Mathematics using TPS among students in Ogun State.

From the look of things it seems that use of think-pair-share learning strategy as an innovative learning strategy in educational research has been flooded. This is an indication that the learning strategy has the ability to make individual learn new and difficult concepts. But the question now is, why is it that the use of think-pair-share as a learning strategy is very scanty in the concept of Computer Studies and in the study areas of the two local governments (Ayamelum and Anambra East) in Otucha education zone of Anambra State used in this study? Based on the fact the one done by Okekeokosisi and Okigbo and other researchers in field were done in Delta State, other places outside the present area of study and even among senior secondary school students. On this note the researchers seek to harness the usefulness of TPS in teaching and learning of a technological driven subject in junior secondary school at a research drought educational zone in Anambra State Nigeria. Thus, this study was focused on the effectiveness of TPS on junior secondary students' academic achievement in Computer Studies in Otuocha education zone, Anambra State, Nigeria.

Purpose of the study

The purpose of this study was to investigate if secondary school students in Anambra State, Nigeria can improve in their achievement in computer studies through think pair share learning strategy. Specifically, the study sought to:

1. the difference in the mean achievement scores of students taught Computer Studies using thin- pair-share learning strategy and those taught using lecture method.
2. the difference in the mean achievement scores of male and female students taught computer studies using think-pair-share learning strategy.

Research Questions

In order to achieve the specific purposes of the study, the following research questions guide the study:

1. What is the mean different in achievement scores of students taught Computer Studies using think-pair-share learning strategy and those taught using lecture method?
2. What is the mean difference in achievement scores of male and female students taught Computer Studies using think-pair-share learning strategy?

Hypotheses

The following null hypotheses tested at 0.05 level of significance;

1. There is no significant difference in the mean achievement scores of students taught Computer Studies using think-pair-share learning strategy and those taught using lecture method.
2. There is no significant difference in the mean achievement scores of male and female students taught Computer Studies using think-pair-share learning strategy.

Method

The design for the study was quasi-experimental, specifically; pre-test/post-test non-equivalent control group design. The study was carried out in Otuocha education zone of Anambra State. Population of the study consisted of all the JSS2 Junior secondary school students in Government owned co-educational schools in Otuocha education zones of Anambra State. The sample was obtained using multi-stage sampling procedure. First, stratified random sampling was used to divide the zone into strata to select two local governments (Anambra East local government area and Ayamelum local government area) in Otuocha education zone. Secondly, using simple random sampling (balloting without replacement) two schools was drawn from Anambra East local government area and the other two schools was drawn from Ayamelum local government making it a total of four schools. Thirdly, using simple random sampling, one school of three intact classes (streams A, B and C) from Anambra East local government area was

assigned to experimental group (male 58 and 67 female), with population of 125 students'. The second school from the same local government, two intact classes was assigned to control group (male 31 and female 54) with population of 85 students'. Also, using simple random sampling one school of two intact classes from Ayamelum local government area was assigned to experimental group (male 40 and female 57) with population of 97 students, the other school of two intact classes from the same local government area was assigned to control group (male 40 and female 46) with population of 86 students'. In summary, two schools were used for experimental group with 211 students (male 98 and female 113) who were taught Computer Studies concept of virus, spreadsheet package, spreadsheet features and terminologies and search engines with TPS learning strategy. Similarly, two schools were used in the control group with 182 number of JSS2 students (male 71 and female 111) who were taught Computer Studies under concept of Computer Virus, Search Engine, Spreadsheet Packages and Spreadsheet features and terminologies with lecture teaching method. Therefore, total number of experimental and control groups that participated in the study was 393 students' from nine intact classes in junior secondary school JSS2 in Otuocha education zone

Instrument

The study used a 50-item Computer Studies Achievement Test (CSAT), adapted from the BECE exam and aligned with the junior secondary curriculum topics like viruses, search engines, and spreadsheets. Validated by three experts University lecturers from Computer Science, Science Education, and Education faculties they checked for clarity, relevance, and appropriateness. The instrument's reliability was established with KR-20, with a coefficient of 0.70, indicating good internal consistency. Prior to the main study, the CSAT was pilot-tested on 30 JSII students outside the study area to refine readability and timing. Data from pre-test and post-test administrations were analyzed using mean, standard deviation, and ANCOVA, with the latter testing hypotheses at a 0.05 significance level. The mean answered research questions, while standard deviation assessed score homogeneity. Using SPSS version 23.0, the analysis determined whether to accept or reject hypotheses based on p-values relative to the 0.05 threshold, ensuring rigorous statistical evaluation of the teaching strategies' effects on students' computer achievement.

Results

Research Question 1

What is the mean different in achievement scores of students taught Computer Studies using think-pair-share learning strategy and those taught using lecture method?

Table 1: Mean and Standard Deviation of Achievement scores of Computer Students' taught with Think Pair Share and those taught with Lecture Method

		Pretest		Posttest		
Groups	N	Mean	SD	Mean	SD	Mean Mean Gain Difference
TPS	211	47.08	10.48	61.33	9.03	14.25
LM	182	43.33	9.84	50.20	5.38	7.38 6.87

Table 1 shows students taught with TPS learning strategy had pre-test and post-test mean scores of 47.08 and 61.33, respectively, with standard deviations of 10.48 and 9.03. Those taught with Lecture Method (LM) scored 43.33 pre-test and 50.20 post-test, with standard deviations of 9.85 and 5.38. The higher pre-test variability indicates more score spread initially, but scores became more concentrated after teaching. The increase in mean scores suggests the treatment improved student achievement overall. The experimental group (TPS) had a higher post-test mean than the control group (LM), indicating its greater effectiveness. The mean gain score was 14.25 for TPS, compared to 6.87 for LM a difference of 7.38, favoring TPS, which led to better Computer Studies achievement

Research question 2

What is the mean difference in achievement scores of male and female students taught Computer Studies using think-pair-share learning strategy?

Table 2: Mean and Standard Deviation of Achievement Scores of Male and Female Computer Students' taught with Think Pair Share

Gender	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD	Mean Gain Mean Difference	Gain
Male	98	47.14	7.29	62.93	6.43	15.79 2.29	
Female	113	47.00	7.55	60.50	6.94	13.50	

Table 2 presents mean and standard deviation scores for male and female students taught Computer Studies with TPS learning. Males had pre-test and post-test means of 47.14 and 62.93 (gain 15.79), while females scored 47.00 and 60.50 (gain 13.50). Standard deviations decreased from pre-test to post-test for both groups, indicating reduced score variability and more scores near the mean after instruction. Males scored higher than females on the post-test, and the mean gain difference of 2.29 favors male students, suggesting they benefited slightly more from the TPS strategy in achieving in Computer Studies

HO $_1$: There is no significant difference in the mean achievement scores of students taught Computer Studies using think-pair-share learning strategy and those taught using lecture method.

Table 3: Analysis of Covariance (ANCOVA) of Achievement Scores of Students Taught Computer Studies using Think Pair Share and Those Taught using Lecture Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig	Decision
Corrected Model	3388.78[a]	1	3388.78	40.80	0.000	
Intercept	53041.538	1	53041.538	38.07	0.000	
Achievement	3161.79	1	3161.79			S
Groups	5265.815	1	5265.815			

Error	15696.16	391	83.05
Total	59215.000	393	
Corrected Total	22027.25	392	

S= Significant, NS = Not Significant

Table 3 shows a significant difference in achievement scores between students taught with TPS and LM, F(1, 391) = 38.07, p=0.000. Since the p-value is below 0.05, the null hypothesis is rejected, indicating students taught with TPS achieved higher scores than those taught with LM. This suggests TPS is more effective in improving Computer Studies achievement.

HO $_2$: There is no significant difference in the mean achievement scores of male and female students taught Computer Studies using think-pair-share learning strategy.

Table 4: Analysis of Covariance (ANCOVA) of Male and Female Students' Achievement Taught Computer Studies using Think Pair Share

Source	Type III Sum of Squares	df	Mean Square	F	Sig	Decision
Corrected Model	4.367[a]	2	1.456			
Intercept	1617.95	1	1617.95			
Achievement* Gender and TPS	50.62	1	50.62	20.72	0.000	S
Groups	702.892	1	702.892	4.49	0.037	
Error	7888.27	209	3.089			
Total	10023.85	211				
Corrected Total	378.128	210				

S= Significant, NS = Not Significant

Table 4 reveals a significant difference in achievement scores between male and female students taught with TPS, F (1,209) = 4.49, p=0.037. Since $p<0.05$, the null hypothesis is rejected, indicating males scored higher than females, with the difference favoring male students' achievement in Computer Studies.

Discussion

The discussion of findings were organized under the following:

1. Variations in the average achievement scores between students taught Computer Studies with TPS and those taught with LM.
2. Male and female variations in the average achievement scores between students taught Computer Studies with TPS.

Variations in the average achievement scores between students taught Computer Studies with TPS and those taught with LM.

The findings of the study showed that students taught Computer Studies with TPS learning strategy achieved more than those taught Computer Studies with LM. Thus there is a significant difference in the mean achievement scores of students taught Computer Studies using think-pair-share learning strategy and those taught using lecture method. The above finding in research question one is in consonance with Omeje (2024) who reported that students who were taught acid-base reactions using think-pair-share instructional strategy had improved academic achievement than their counterparts who were taught using lecture method. The finding in research question one is also in line with the finding of Abiodun et. al. (2022) who revealed that there is the main effect of the strategy on the student's achievement in Mathematics in use of TPS.

Base on the hypothesis one postulated, the finding is in line with Okekeokosisi and Okigbo (2019) who reported that there is a significant difference in the mean achievement scores of students exposed to THPSIS and conventional group in favour of former group but not in line with Emmanuel et. al. (2022) revealed that there is no significant difference in the mean performance scores of students with varied learning styles taught Physics using Think-Pair-Share learning strategy. The reason of study showing that students taught Computer Studies with TPS learning strategy achieved more than those taught Computer Studies with LM and a significant differences between students taught within the two independent variable in Computer Studies concepts studies could be that TPS is active, collaborative nature, enhancing understanding and engagement, whereas the lecture method is more passive, limiting students' interaction and skill development. Thus, this study has joined the group of scholars that

observed a high academic achievement among junior secondary school students taught Computer Studies using TPS over students taught the same concepts using lecture method with a significant differences in the two learning strategy which favours TPS.

Male and female variations in the average achievement scores between students taught Computer Studies with TPS.

The study showed that male students taught Computer Studies with TPS achieved better than their female counterpart, thus there is a significant difference in the mean achievement scores of male and female students taught Computer Studies using think-pair-share learning strategy. The finding in research question two is in conformity with that of Omeje (2024) who found that male students had improved academic achievement than their female counterparts when exposed to think-pair- share instructional strategy in Enugu State, Nigeria. Also the finding is conformity in significant with study of Emmanuel et. al. (2022) who observed that a significant differences existed in the mean performance scores of both male and female students with varied learning styles who are taught Physics using Think-Pair-Share learning strategy in Benue State, Nigeria.

Whereas the finding in hypothesis two is not in line with Okekeokosisi and Okigbo (2019) who observed no significant difference in the mean achievement scores of male and female students exposed to THPSIS and that of Abiodun et. al. (2022) who observed no significant main effect of gender on the achievement of the students in Mathematics using TPS among students in Ogun State. The reason of male students that were taught Computer Studies with TPS achieving better than their female counterpart and a significant difference that favours the male students could be that male students may have favored the interactive nature of TPS, leading to better engagement and performance, possibly due to social or cultural factors influencing participation of their female counterpart.

Suggestions

These suggestions were offered in light of the study's findings:

1. Incorporate TPS strategies across various subjects to enhance student achievement.
2. Train teachers to effectively facilitate TPS activities.
3. Promote gender-inclusive methodologies to support female students.
4. Conduct further research on cultural and social factors influencing gender performance.

5. Encourage collaborative learning environments to boost engagement and understanding for all students.

Conclusion

The study concludes that TPS effectively improves students' achievement in Computer Studies compared to traditional lecture methods. Additionally, male students benefit more from TPS than females, indicating a need for gender-sensitive approaches to ensure equitable learning outcomes for all students.

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