

**EFFECT OF THINK-PAIR-SHARE STRATEGY ON SECONDARY  
SCHOOL STUDENTS' INTEREST AND PERFORMANCE IN BASIC  
SCIENCE IN OREDO LOCAL GOVERNMENT AREA, EDO STATE**

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**Abstract**

*This study examines the effects of implementing the think-pair-share instructional technique on the levels of interest and academic accomplishment among secondary school students in the field of basic science, specifically within the Oredo Local Government Area of Edo State. The research utilised a quasi-experimental approach, incorporating pre-test and post-test evaluations. A sample size of 40 students was chosen via convenience sampling. Out of the total sample size, a group of 20 students was selected to receive instruction using the think-pair-share technique, constituting the experimental group. The remaining 20 students were assigned to the control group and were taught using traditional methods. To measure the students' development, both a Basic Science Achievement Test (BSAT) and a Basic Science Interest Scale (BSIS) were administered both before and after the study intervention. The study questions and hypotheses were addressed using statistical analysis, which involved calculating the mean, standard deviation (SD), and conducting a t-test at a significance level of 0.05. The research inquiries and hypotheses were addressed by employing statistical techniques such as calculating the mean ( $\bar{x}$ ), determining the standard deviation (SD), and conducting a t-test at a significance level of 0.05. The data indicated that there is a substantial difference in the mean performance of students in the experimental and control groups for the pre-test and post-test. Based on the aforementioned findings, it is advisable for*

*Basic Science instructors to include the Think-Pair-Share Instructional Strategy into their pedagogical approaches, especially targeting the junior secondary school level. By implementing this approach, educators are able to accommodate the wide range of learning preferences present in their classes, thereby enhancing the efficacy of instructional practices and promoting more successful educational outcomes.*

**Keywords:** Think-Pair-Share Strategy, science education, interest, performance, attitude, basic science

## **Introduction**

To promote an improved quality of life and facilitate socio-economic progress, fostering a positive attitude towards science education is essential for Nigerians. A favorable disposition towards science learning is pivotal for achieving desired developmental outcomes. From an alternative perspective, the absence of fundamental scientific skills and their practical applications could consign Nigeria to a role of science consumer rather than a producer or manufacturer (Akanmu, 2019).

Basic Science, an integral component of the scientific field, plays a critical role in comprehending the world around us, both externally and internally. Serving as the foundation for science and technology, many tools underpinning advancements in these domains trace their origins to Basic Science. This underpinning has been instrumental in various scientific and technological breakthroughs, including the evolution of Information Technology, which has transformed the globe into a connected global village through satellite and computer utilization.

Despite its vital significance in the nation's scientific and technological progress, Basic Science's comprehension has waned over the years, as evidenced by lackluster student performance. Contributing factors to this unsatisfactory performance include student disinterest, insufficient laboratory resources, and subpar teaching methodologies (Jacob, 2020).

The Think-Pair-Share (TPS) strategy developed by Frank Lyman and colleagues in Maryland in 1981 presents a cooperative learning approach. Named after its three sequential phases, TPS promotes individual and collaborative student involvement. It entails individual contemplation on a topic or question followed by idea exchange with peers. Engaging in discussions with a partner maximizes participation, focalizes attention, and enhances comprehension of reading materials. This cooperative strategy enhances the learning experience, affording students more time to ponder, react, and aid each other's understanding (Jumanta, 2014).

The Think-Pair-Share approach facilitates various advantages, as stated by Jumanta (2014). It reinforces information retention, enabling mutual learning and preliminary idea exchange before presenting to the class. This method promotes thorough thought and solution finding through peer collaboration, as highlighted by Sejani's (2016) research. Furthermore, Think-Pair-Share constructs an active learning environment, fostering engagement and improved learning outcomes within the classroom. As noted by Napitupulu and Surya (2017), this technique also encourages interaction and cooperation among students, potentially kindling an enhanced interest in Basic Science.

Furthermore, Think-Pair-Share (TPS) is a collaborative learning approach where students collaborate to solve problems or address questions arising from assigned readings (Amosun, 2012). This strategy encourages individual thought formation and sharing of ideas with peers. By prioritizing pupil participation, Think-Pair-Share contrasts with traditional recitation techniques, cultivating active engagement (Sumarsih & Dedi, 2013). With its three-stage process of thinking, sharing with a partner, and group sharing, this approach harmonizes cognitive and social aspects of learning, thereby nurturing both thinking skills and knowledge construction. This strategy's advantages surpass traditional question-based methods, allowing ample time for consideration, fostering robust reasoning, and encouraging risk-taking and idea contribution due to prior partnership discussions (Ogunkola, 2008).

Given the critical role of Science in societal development, effective teaching strategies are crucial to enhancing students' performance in Basic Science. This is particularly significant as science and technology are vital indicators of national advancement (Ayinla, 2015). Acknowledging the diverse learning needs of students, it is imperative to employ tailored teaching strategies like the Think-Pair-Share approach. In line with this objective, this study aims to evaluate the impact of the Think-Pair-Share strategy on fostering secondary school students' interest in Basic Science within Edo State.

### **Statement of the Problem**

In recent years, the academic performance of students in Junior Secondary Schools in Basic Science has raised concerns in educational circles, particularly in the Oredo Local Government of Edo State. Despite the efforts of educators and policymakers to improve learning outcomes, there persists a noticeable disparity between the desired academic achievements and the actual performance of students in the subject (Edo State BECE results for 2018, 2020 & 2021). This discrepancy is indicative of an underlying issue that requires thorough investigation.

One potential factor contributing to this academic performance gap is the teaching methodology employed in the classroom. Traditional lecture-based instruction often fails to actively engage students, inhibit collaborative learning, and hinders the development of critical thinking skills. It is against this backdrop that the Think-Pair-Share (TPS) strategy emerges as a potential solution. TPS promotes active student participation, interaction, and cooperative learning, thus holding the promise of positively impacting academic performance.

However, the effectiveness of the Think-Pair-Share strategy as an intervention to enhance students' academic performance in Basic Science remains largely unexplored in the context of Junior Secondary Schools within the Oredo Local Government of Edo State. Consequently, there is a pressing need to investigate whether the adoption of the Think-Pair-Share strategy can bridge the gap in academic achievement and improve students' understanding and performance in Basic Science.

### **Research Question**

For the purpose of the study, the research questions include;

1. What is the difference in mean scores performance between students taught Basic Science using think-pair-share strategy and those taught using conventional strategy?
2. What is the difference in mean interest scores between students taught Basic Science using think-pair-share strategy and those taught using conventional strategy?

### **Research Hypotheses**

The following hypotheses were formulated and tested at 0.05 level of significance.

1. There is no significant difference in mean scores performance between students taught Basic Science using think-pair share instructional strategy and those taught using conventional method.
2. There is no significant difference in the mean interest scores of students taught Basic Science using think-pair-share instructional strategy and conventional strategy.

### **Methodology**

The study used a quasi-experimental design, involving a pre-test and post-test assessment administered to the students. The pre-test aimed to gauge the students' familiarity with the taught concepts, while the post-test aimed to measure their comprehension after exposure to the treatment. The study sample consisted of 490 JSS 3 students from Oredo Local Government Area, Edo State. The research sample comprised forty students conveniently selected from Ogbe Secondary School and Travis Christian College, Oredo Local Government Area, Edo State.

Twenty students were selected from each school. The 20 Students from Ogbe Secondary school were taught using conventional method (control group) while the twenty (20) students from Travis Christian College were instructed using the think-pair-share strategy (experimental group).

The instruments for data collection include Basic Science Achievement Test and Basic Science Interest scale. The Basic Science Achievement Test used in this study comprises 40 multiple-choice questions on Basic Electricity, each with four options. These questions are specifically drawn from past Basic Education Certificate Examination (BECE) questions, ensuring that they align closely with the curriculum and content students are expected to master in basic science.

The Basic Science Interest Scale(BSIS) was designed to measure the respondents' levels of interest in basic scientific concepts and principles. Respondents were asked to express their opinions on a series of statements using a 4-point Likert scale. The BSIS comprised two sections: Section A encompassed biographical information, while Section B featured 16 items rated on a four-point scale: Strongly Agreed (SA), Agreed (A), Strongly Disagreed (SD), and Disagreed (D).

The scale includes the following response options:

Response	Rating
Strongly Agree(SA)	4
Agree (A)	3
Disagree (D)	2
Strongly Disagree(SD)	1

Students were provided with the Basic Science Achievement Test (BSAT) and Basic Science Interest Scale (BSIS) questions. They were given a time limit of approximately 60 minutes, and their responses were collected immediately after the allotted time. The BSAT and BSAS served as instruments for both pre-test and post-test evaluations.

A Formal permission was sought from the principals of the two Schools used for the study. The Forty (40) students selected were grouped into two groups (that is twenty (20) students in experimental group and twenty (20) students in the control group). Using continuous assessment records and past internal examination results,

the researchers identified high-performing students and those at risk of academic underachievement, subsequently pairing them. The BSAT and BSIS were first administered (that is pre-test) to the students in both experimental and control groups and the scores were carefully recorded before the treatment session which lasted for two weeks. The students in the experimental group were taught Basic Electricity using the think-pair-share instructional strategy, whereas the students in the control group were taught Basic Electricity using the conventional method of instruction.. A day after the treatment session, post- test (BSAT and BSIS as in pre-test) were administered on the students in both the experimental and control groups. The posttest was marked, scored and their various scores were collected for analysis. Descriptive statistics including frequency counts, mean, and standard deviation were employed for data analysis. Additionally, hypotheses were evaluated using t-tests.

**Results**

**Research Question One: What is the difference in mean scores performance between students taught Basic Science using think-pair-share strategy and those taught using conventional strategy?**

**Table 1**

*Difference in mean scores performance between students taught basic science using think-pair-share strategy and those taught using conventional strategy*

Group	Pre –Test			Post –Test	
	N	Mean(x)	SD	Mean(x)	SD
Experimental	20	38.20	9.96	80.23	12.85
Control	20	37.11	9.68	43.30	6.27
Mean Diff.		1.09		36.93	

Results presented in Table 1 reveal that the experimental group exhibited an average achievement score of 38.20, accompanied by a standard deviation of 9.96 during the pre-test BSAT. In contrast, the control group displayed an average

achievement score of 37.11, with a standard deviation of 9.68 for the same test. The disparity in mean scores between these two groups amounted to 1.09. This implied that the student's pre- test performance in the two groups is very close.

Moving on to the post-test BSAT, the experimental group attained a mean score of 80.23, alongside a standard deviation of 12.85. Conversely, the control group achieved a mean score of 43.30, with a standard deviation of 6.27. The comprehensive findings in Table 1 strongly indicate that the experimental group outperformed the control group in the post-test, showcasing a notably higher mean score. The disparity in mean scores between these two groups in the post-test was 36.93. This indicates that there is a significant difference between the performance of students taught using think pair share instructional strategy (Experimental) and those taught using the conventional method (control group).

**Research Question Two: What is the difference in mean interest scores between students taught Basic Science using think-pair-share strategy and those taught using conventional strategy?**

**Table 2**

*Descriptive Statistics of Groups' Mean Interest Scores in Pre and Post Test*

Group	Pre –Test			Post –Test	
	N	Mean(x)	SD	Mean(x)	SD
Experimental	20	1.48	0.38	3.50	1.43
Control	20	1.42	0.36	2.30	1.21
Mean Diff.		0.06		1.32	

The result presented in Table 2 demonstrates that the experimental group exhibited an average interest rating of 1.48, accompanied by a standard deviation of 0.38. In contrast, the control group displayed an average interest rating of 1.42, with a corresponding standard deviation of 0.36, during the initial administration of the BSIS (Basic Science Interest Scale) pre-test. The disparity in means between the two groups was determined to be 0.06. Following the intervention, the experimental group's average interest rating surged to 3.50, alongside a standard deviation of 1.43. Conversely, the control group's post-test results indicated an average attitude test score of 2.30, accompanied by a standard deviation of 1.21. The difference in



average scores between the two groups in the post-test BSIS was calculated to be 1.32

**Testing of Hypotheses**

**Hypothesis One**

**There is no significant difference in mean scores between students taught Basic Science using think-pair share instructional strategy and those taught using conventional method.**

To test for this hypothesis, t-test statistics was also used to analyze the mean scores. The summary of this analysis is shown on Table 3.

**Table 3**

*t-test Analysis of Posttest Mean Achievement Scores of Students Exposed to Think-Pair-Share Instructional Strategy and the Conventional Method*

Group	N	X	SD	Df	t-crit.	t-cal.	Decision
Experimental	20	80.23	12.85				
Control	20	43.30	6.27	38	2.02	11.55	Significant

The information presented in Table 3 indicates a noticeable distinction between the academic performances of students who were instructed in Basic Science through the think-pair-share teaching approach compared to those taught via conventional methods. As a result, hypothesis 1 was rejected. This implied that there is a significant difference in mean scores between students taught Basic Science using think-pair share instructional strategy and those taught using conventional method.

**Hypothesis Two**

**There is no significant difference in the mean interest scores of students taught Basic Science using think-pair-share instructional strategy and conventional strategy.**

To test this hypothesis, t-test statistic was also used to analyze the mean scores. The summary of this analysis is shown on Table 4.



**Table 4**

*t-test Analysis of Posttest Mean Interest Score of Students Exposed to Think-Pair-Share Instructional Strategy and the Conventional Method*

Group	N	Mean ( $\bar{x}$ )	SD	Df	t-crit.	t-cal.	Decision
Experimental	20	3.50	1.43				
Control	20	2.30	1.21	38	2.02	2.87	Rejected

Table 4 illustrates a notable distinction in the level of collaboration among students who were instructed using the think-pair-share strategy for Basic Science compared to those who underwent the conventional teaching approach (t-value = 2.87, degrees of freedom = 38, p-value < 0.05). As a result of this finding, the initial hypothesis was refuted. Consequently, it is inferred that there is significant difference in the mean interest scores of students taught Basic Science using think-pair-share instructional strategy and those taught with conventional strategy.

### Discussion of Findings

After getting the intervention during the post-test phase, the results shown in Table 1 show how well both the experimental and control groups did in school. The experimental group demonstrated a mean score of 80.23, which stands in stark contrast to the control group's mean score of 43.30. The calculated discrepancy in average scores between the two groups in the post-treatment BSAT was found to be 36.93. The examination of null hypothesis 1, as presented in Table 3, indicated a statistically significant disparity in the accomplishment scores between the two groups. This finding suggests that the experimental group, which was subjected to the think-pair-share teaching technique, demonstrated superior performance compared to their counterparts who received instruction using the standard approach. As a result, the aforementioned data support the rejection of the null hypothesis, which posits that there is no statistically significant disparity in academic performance between students who get instruction in basic science using the think-pair-share instructional technique and those who are taught using conventional methods. The findings presented align with previous studies conducted by Napitupulu and Surya (2017) as well as Akanmu (2019), which also saw comparable enhancements in students' academic performance while employing the think-pair-share educational approach across many academic disciplines. The think-pair-share teaching technique, which places a strong emphasis on student-

centred learning, is an innovative approach that basic science teachers might consider adopting based on the findings of this study.

The process of science education necessitates collaborative thinking and reasoning, wherein individuals work together as a team. This approach allows for the integration of both average and high-achieving learners, fostering an environment where they may identify rationales and be motivated to improve their performance. The suboptimal academic outcomes and lack of engagement among students in basic science suggest that traditional instructional methods are insufficient in facilitating the attainment of the desired goals and objectives outlined in the science curriculum in Nigeria. Research questions 2 and 2 were formulated with the objective of examining the influence of the think-pair-share method on the attitudes of junior secondary school students towards basic science. The results of the data analysis obtained from the Behavioural Self-Control Assessment Scale (BSAS) administered to both the experimental and control groups after the intervention are presented in Table 2. The data presented in this table demonstrates that the experimental group obtained an average rating of 3.42, while the control group received a mean rating of 2.10. The difference in average ratings between the two groups on the post-treatment Brief Substance Abuse Scale (BSAS) was shown to be 1.32. The statistical significance of the observed difference in average ratings between the two groups on the post-treatment Behavioural Addiction Severity Scale (BSAS) has been determined to be significant at the 0.05 level of significance, as indicated in Table 4. As a result, it was seen that the implementation of the think-pair-share educational strategy significantly increased the level of student engagement in the experimental group compared to the control group. This discovery aligns with the previous study conducted by Ajiboye and Jitoni (2008), which established a significant positive association between students' inclination towards basic science and their performance in the discipline. If the level of interest exhibited by learners is below the mean as a result of the teaching technique employed, the instructor may find themselves expending valuable classroom time since learner interest has a direct impact on their academic performance in the given topic.

## **Conclusion**

In conclusion, the Think-Pair-Share strategy has proven to be a valuable tool for transforming the learning experience in basic science education in Oredo Local Government, Edo State. Its positive impact on students' attitudes and performance underscores the importance of fostering collaborative and interactive learning environments to cultivate a generation of enthusiastic and academically successful learners.

## Recommendations

Based on the findings of this study the following recommendations are made:

1. Basic Science teachers should always adopt the Think-Pair-Share Instructional Strategy for effective teaching and learning at the junior secondary school level. This will enable them take care of the diverse learning Style in the classroom.
2. Teachers and policy makers in education should structure the curriculum to reflect think-pair-share when designing instruction for students.
3. Workshops, seminars, conference and symposia should be organized for the training and retraining of Basic Science teachers on the use of Think-Pair-Share Instructional Strategy. This is because the strategy helped students to learn and retain better.
4. Research studies on think-pair-share and other innovative teaching strategies should be encouraged by the Federal, State ministry of education and higher institutions of learning.

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