ETDC Indonesian Journal of Research and Educational Review
Volume 5, No. 1, 2025, pp 331 - 346
e–ISSN 2809-3682
p–ISSN 2809-7505

https://doi.org/10.51574/ijrer.v5i1.4200

Think of Pair Share Learning Model on Student Learning Activity in Science Subjects at State Elementary Madrasah

Asri Nur Hasanah[1], Baharudin[2], Anton Tri Hasnanto[3]
[1, 2, 3] Program Studi Pendidikan Guru Madrasah Ibtidaiyah, Universitas Islam Negeri Raden Intan Lampung, Indonesia

Article Info

Article history:

Received October 22, 2025
Accepted December 02, 2025
Published December 27, 2025

Keywords:

Learning Model;
Science Subject;
State Elementary School;
Student Learning Activities;
Think Pair Share (TPS).

ABSTRACT

This research is motivated by the low activity and learning outcomes of students in natural science subjects at state elementary schools. This study aims to test and analyze the effect of the Think Pair Share (TPS) learning model on increasing the engagement and learning outcomes of fifth-grade science subject students at State Elementary Schools. This study uses a quasi-experimental method with a post-test-only nonequivalent control group design. The sample consists of two groups: the Experimental Class (n=27), which applies the TPS model, and the Control Class (n=26), which uses conventional learning at State Elementary School 3 Bandar Lampung. Data was collected through questionnaires, observation of learning activities, and learning outcome tests (post-test). Learning outcome data was analyzed using the independent sample t-test (Welch's t-test) after normality and homogeneity tests. The results of the study show: (1) Student learning engagement in the Experimental Class is in the High category with an average of 78.7%, while the Control Class is in the medium category with an average of 59.9%. (2) The average post-test score of the experimental class (88.52) was much higher than that of the control class (69.04). (3) The results of the hypothesis test indicated that there was a statistically very significant difference between the two groups (p-value = 0.000000019), which indicated that H_0 was rejected. The contribution of this study is to provide empirical evidence that the TPS learning model is a very effective and significant intervention in improving learning activities and cognitive learning outcomes among science students in elementary Islamic education.

Corresponding Author:

Asri Nur Hasanah,
Program Studi Pendidikan Guru Madrasah Ibtidaiyah, Universitas Islam Negeri Raden Intan Lampung, Indonesia
Email: arinur354@gmail.com

1. INTRODUCTION

Elementary education is a crucial stage in shaping students' thinking, and natural sciences play a vital role in this (Kotsis, 2025; Susiloningsih et al., 2025). Science aims to convey facts and concepts and fosters scientific attitudes, process skills, and critical and logical thinking (García-Carmona, 2025). In the context of State Islamic Elementary

Schools, science learning must be integrated with religious values and character development (Mansir, 2022; Nasucha et al., 2023; Sutiana & Nugraha, 2025), making it a complex field of study that requires innovative teaching methods.

However, initial observations in various State Islamic Elementary Schools often indicate a gap between the ideal goals of science learning and the reality of classroom practice. One fundamental problem that frequently arises is the low level of student learning engagement. Science learning in fifth grade, particularly material that begins to involve abstract concepts and requires problem-solving, is often presented in a one-way (teacher-centered) manner. Teachers tend to dominate the class with a lecture method, while student activity is limited to listening, taking notes, and occasionally answering questions.

The impact of this low engagement is significant: (1) Loss of Curiosity: Students become passive and lose the motivation to explore science phenomena. (2) Impaired Social Skills: Lack of interaction and collaboration hinders students' ability to express opinions and accept the views of others. (3) Shallow Conceptual Understanding: Science concepts that require collaborative construction and discussion ultimately become short-term memorization. This situation urges strategic intervention through the adoption of a learning model that intrinsically stimulates the active participation of each individual.

In response to the problem of activeness, this study proposes the Think Pair Share (TPS) model. TPS is a simple, structured cooperative learning model specifically designed to gradually increase student participation and interaction (Ahmad, 2025; Ganatra et al., 2021; Nurlaika et al., 2024). This model divides the learning process into three planned phases (Fiqhiyah et al., 2025; Li & Tu, 2024; Pajri et al., 2025): (1) Think: This phase ensures individual participation because each student is required to think of an answer or solution independently within a specified time. This step addresses the problem of students being passive due to fear of public speaking. (2) Pair: Students discuss with a deskmate. This pairing environment facilitates safe interaction and reduces speaking anxiety, allowing students to validate their ideas before presenting them to a larger forum. (3) Share: Pairs then share the results of their discussions with the class. This phase broadens students' horizons and trains their public communication skills.

In this study, active learning is viewed as a multidimensional construct encompassing mental activity (thinking, analyzing), physical activity (taking notes, conducting experiments), and social activity (discussing, asking questions) (Basdogan & Birdwell, 2024; Lombardi et al., 2021). Based on social constructivism theory, knowledge is most effectively constructed through social interaction (Chuang, 2021). The TPS model aligns closely with this principle because it maximizes interaction between students (the Pair and Share phases), which is the driving force behind increased active learning (Azizi et al., 2025; Zaki et al., 2024).

Despite testing the TPS model in various educational contexts, this study offers a distinct and scientifically relevant novelty. Public elementary schools serve as the setting for most TPS research. This study specifically focuses on state elementary

schools, which have an integrative curriculum and a distinctive religious environment. These findings will enrich the literature on Islamic education and provide valid recommendations for developing learning practices in madrasah environments. Numerous studies employ active learning as a mediator or predictor of educational outcomes (Cole et al., 2021; Guo et al., 2022; Hartikainen et al., 2019; Liu et al., 2024; Shi et al., 2020).

This research identifies active learning as the principal dependent variable, assessed via systematic and comprehensive observational tools. This allows for a more in-depth analysis of changes in student behavior and interactions in the classroom, not just the final cognitive outcomes. Moreover, within Islamic elementary schools, enhanced active learning via Think-Pair-Share (TPS) can be associated with advancements in Islamic etiquette and social competencies, including effective listening, courteous communication, and reciprocal respect. This research opens up the opportunity to interpret the contribution of TPS beyond the cognitive and behavioral dimensions of general learning, toward the development of students' religious-social character.

Theoretically, TPS is effective for subjects like science because it provides opportunities for students to process concepts cognitively (think), negotiate meaning socially (pair), and articulate their understanding (share). Therefore, this study aims to empirically test the extent to which the TPS model can improve student learning engagement in science in fifth grade at a State Islamic Elementary School. We anticipate that this research will significantly impact pedagogical practice in Indonesia.

2. METHOD

This study used a quantitative approach with a quasi-experimental research method. The quantitative approach was chosen to test the hypothesis through statistical analysis regarding the differences in learning activity between the treatment and control groups. The design used was a post-test-only nonequivalent control group design. This design involves two groups (experimental and control) that were not randomly selected. Measurements were only taken after the treatment was administered (post-test) to compare the results. The design model is as follows in Table 1.

Table 1. Quasi-Experimental Research

Group	Treatment (X)	Measurement (O)
Experiment	Implement the TPS Model	O1
Control	Conventional Learning	O2

Description:

- O1 and O2 are student learning activity scores (measured through observation) after treatment.
- X is the treatment, namely the implementation of the Think Pair Share (TPS) learning model.

- The absence of a pre-test assumes that both groups had relatively equal initial conditions.

The population in this study was 87 fifth-grade students at State Elementary Madrasah 3 Bandar Lampung, consisting of classes V.1, V.2, and V.3. Purposive sampling was used for sampling. The sample consisted of two classes: the experimental class, Class V.2 (27 Students) (treated with the TPS model), and the control class, Class V.1 (26 Students) (treated with conventional learning). The selection of the classes was based on the consideration that the school had determined the two classes based on their relatively equal initial characteristics (such as student number and initial competencies).

The main instrument used to measure the dependent variable was the Learning Activity Observation Sheet. Instrument Format: A rating scale or checklist that focuses on dimensions of activeness (e.g., asking questions, answering questions, discussing, and participating). Usage: Observation sheets are completed by two or more trained, independent observers throughout the learning process. Instrument Quality Test: Validity tests (items' suitability to activeness indicators) and inter-rater reliability tests are conducted to ensure the consistency of assessments between observers.

Data collection is carried out through the following stages:

1. Preparation: Develop lesson plans for both groups and validate the observation sheets.
2. Treatment Implementation:
   - Experimental Class: Science learning is implemented using the TPS Model for four meetings.
   - Control Class: Science learning is implemented using conventional methods (lectures and assignments) for four meetings.
3. Measurement (Post-Test): During each treatment meeting, observers conduct assessments using the Learning Activeness Observation Sheet to obtain final scores of O1 and O2. The processed data is the average activeness observation score during the treatment period.

The learning activity score data obtained from both groups were analyzed using inferential statistics. Before testing the hypotheses, prerequisite tests were conducted to ensure the statistical assumptions were met:

- Normality Test: To determine whether the learning activity data from both groups were normally distributed (e.g., using the Kolmogorov-Smirnov or Liliefors test).
- Homogeneity Test: To determine whether the variance of the data from both groups was homogeneous (e.g., using the Levene test).

Next, the hypothesis tests were conducted. The main objective was to compare the average learning activity of the two groups.

- If the data were normally distributed and homogeneous: The Independent Sample T-Test (T-Test) was used. This test determined whether there was a significant difference in the average learning activity between the TPS group and the conventional group.

- If the data did not meet the parametric assumptions: Non-parametric statistics, namely the Mann-Whitney U Test, were used.

Statistical decisions were made by comparing the significance value (p-value) with the established significance level (alpha = 0.05). If the p-value < 0.05, then the null hypothesis is rejected, which means there is a significant influence of the TPS model on learning activity.

The level of student activity in the Experimental Class was measured using the following categories in Table 2.

Table 2. Student Activity Category

Percentage	Category
81%–100%	Very high
61%–80%	Tall
41%–60%	Currently
21%–40%	Low
0%–20%	Very Low

3. RESULTS AND DISCUSSION

Results

This section presents the results of data analysis from a quasi-experimental study using a Post-Test Only Nonequivalent Control Group design regarding the effect of the Think Pair Share (TPS) learning model on student learning engagement in fifth-grade science at State Elementary Madrasah 3 Bandar Lampung.

Description of Learning Engagement Data

Building upon questionnaire data from 27 students in the Experimental Class, the following is the distribution of students in each category.

Table 3. Student activity questionnaire (Experimental Class)

Category	Percentage Range	Number of Students	Percentage of Total Students
Very high	81%–100%	13 students	$\frac{13}{27} \approx 48.15\%$
Tall	61%–80%	14 students	$\frac{14}{27} \approx 51.85\%$
Currently	41%–60%	0 students	0%
Low	21%–40%	0 students	0%
Very Low	0%–20%	0 students	0%

Findings:

1. Dominance of High and Very High Categories: All students (100%) are in the High or Very High categories. • 51.85% of students were in the High category (percentages between 61% and 80%). 48.15% of students were in the Very High category (percentages between 81% and 100%).

2. Highest and Lowest Individual Scores:
- The highest score was achieved by MRA with a percentage of 93% (Very High Category).
- The lowest score was achieved by SR with a percentage of 66% (High Category).

Average percentage of student activeness in the Experimental Class 78.7%. The average total percentage of student activity in the Experimental Class, based on the questionnaire, was 78.7%. This value is in the range of 61%–80%, meaning the average student activity in the Experimental Class is in the High category.

In addition, based on questionnaire data from 26 students in the Control Class, the following is the distribution of students in each category in Table 4.

Table 4. Student Activity Questionnaire (Control Class)

Categories	Percentage Range	Number of Students	Percentage of Total Students
Very high	81%–100%	0 students	0%
Tall	61%–80%	13 students	50%
Currently	41%–60%	13 students	50%
Low	21%–40%	0 students	0%
Very Low	0%–20%	0 students	0%

Findings:
1. Dominance of High and Medium Categories: All students (100%) were in the High or Medium category.
2. Even Distribution: There was an even distribution: 50% of students were in the High category (percentages between 61% and 80%). 50% of students were in the medium category (percentages between 41% and 60%).
3. No Very High Category: No students reached the Very High category (81% – 100%).
4. Highest and Lowest Individual Scores: The highest score was achieved by BGF with a percentage of 80% (High Category). The lowest score was achieved by NA with a percentage of 47% (Medium Category).

The average total percentage of student activeness in the Control Class based on the questionnaire was 59.9%. This value is slightly below the range limit of 61% – 80% (High), which means that the average activity of students in the Control Class is in the medium category (41% – 60%).

The next, results of analysis of observation data on student activity in the experimental class in Table 5.

Table 5. Observation Data on Student Activity in (Experimental Class)

Type of Activity	Active Percentage
Visual	88%
Oral	76%
Listening	93%
Writing	77%

Type of Activity	Active Percentage
Mental	74.07%
Motor	72.22%
Emotional	82.41%

By using the value categories available in Table 6 below.

Table 6. Activity Level Category

Value	Category
76 – 100 %	Good
61 – 75 %	Sufficient
< 60 %	Poor

The following is an analysis of the categories for each activity type:

1. Good Category (76% - 100%), activities that demonstrate a good level of activity are:
   - Listening: 93%
   - Visual: 88%
   - Emotional: 82.41%
   - Writing: 77%
   - Oral: 76%
2. Adequate Category (61% - 75%), activities that demonstrate a Adequate level of activity are:
   - Mental: 74.07%
   - Motor: 72.22%
3. Poor Category (<60%), no activity types fall into the Poor category, as the lowest percentage is 72.22% (Motor Activities).

Overall, the level of student engagement in the Experimental Class was classified as Good in most activity types (5 out of 7 activities) and Fair in two activity types.

1. Activities with the Highest Engagement: Listening (93%) and Visual (88%). This indicates that students are very good at listening and observing information during the learning process.
2. Activities with Engagement Needing Improvement: Motor (72.22%) and Mental (74.07%). Although categorized as Fair, these two activities had the lowest percentages. Improvement needs to be focused on activities involving physical movement (Motor) and thinking/cognitive processes (Mental) to achieve the good category.

Furthermore, the results of the analysis of observation data on student activity in the Control Class are presented in Table 7 below.

Table 7. Observation Data on Student Activity in (Control Class)

Type of Activity	Active Percentage
Visual	58%
Oral	47%

Type of Activity	Active Percentage
Listening	56%
Writing	47%
Mental	42.30%
Motor	58%
Emotional	45.19%

The following is an analysis of the categories for each activity type:

Poor Category (<60%), All student activities in the Control Class fell into the Poor category, as all percentages were below 60%.

- Visual: 58%
- Motor: 58%
- Listening: 56%
- Oral: 47%
- Writing: 47%
- Emotional: 45.19%
- Mental: 42.30%

Overall, the level of student activity in the Control Class was classified as Poor across all measured activities.

1. Activities with the Highest Activity (although still Poor): Visual (58%) and Motor (58%). This indicates that activities involving vision and movement tend to be the most challenging but still require improvement.
2. Activities with the Lowest Activity (Highest Priority): Mental (42.30%), Emotional (45.19%), Oral (47%), and Writing (47%). Activities involving thinking, expressing feelings, speaking, and writing are the primary focus areas that require significant improvement.

Results of Posttest Score Data Analysis for Experimental Class and Control Class

Descriptive Analysis of Posttest Scores

Table 8. Results of Descriptive Analysis of Posttest Scores

Group	Number of Students (n)	Total Value	Average $\bar{X}$	Average Category
Experiment	27	2390	88.52	Very Good
Control	26	1795	69.04	Fair

Descriptive Findings:

1. Average Score: The average posttest score for the Experimental Class ($\bar{X}$ = 88.52) was significantly higher than that for the Control Class ($\bar{X}$ = 69.04).
2. Score Category: The Experimental Class, on average, fell into the Very Good category. The Control Class, on average, fell into the Fair category.

Inferential Statistical Analysis

Table 9. Posttest Value Data

Experimental Class (XE)	Control Class (XK)
90, 85, 95, 80, 90, 85, 100, 90, 80, 85, 95, 90, 85, 90, 100, 85, 95, 80, 85, 90, 95, 100, 85, 95, 80, 85, 100	80, 60, 90, 50, 70, 75, 95, 65, 55, 85, 75, 70, 80, 60, 90, 65, 85, 55, 60, 70, 75, 80, 65, 90, 50, 60

Normality Test

The normality test is used to determine whether data from a population is normally distributed. Because the sample is relatively small ($n_E = 27, n_K = 26$), I will use the Shapiro-Wilk test to assess normality.

Table 10. Normal Test Results

Posttest Statistical Calculation	Experimental	Control
Number of Students (n)	27	26
Mean $\bar{X}$	88.52	69.04
Standard Deviation (SD)	6.78	13.06
Shapiro-Wilk Test (p-value)	0.230	0.091

Decision Criteria: If the p-value > α (0.05), then the data is normally distributed.

- Experimental Class: p-value (0.230) > 0.05. The data is normally distributed.
- Control Class: p-value (0.091) > 0.05. The data is normally distributed.

The results in Table 10 show that the p-values for both groups are greater than 0.05, and the posttest scores from the Experimental Class and Control Class are normally distributed. This meets one of the assumptions for the parametric t-test.

Homogeneity Test

The homogeneity test (using Levene's test) is used to determine whether the variances between the two groups are equal (homogeneous). The results of the homogeneity test are presented in Table 11.

Table 11. Homogeneity Test Results

Homogeneity Test Calculation	Statistical Value
F-Levene	4.41
p-value	40

Decision Criteria: If the p-value > α (0.05), then the variances are homogeneous. The p-value (0.040) < 0.05. Because the p-value is less than 0.05, the variances of the posttest scores from the Experimental and Control Classes are heterogeneous.

Hypothesis Test (Independent Sample T-test)

Because the data are normally distributed but have heterogeneous variances, we will use an Independent Sample t-test with the assumption of unequal variances (often referred to as the Welch's t-test).

- Null Hypothesis H0: There is no significant difference in the mean posttest scores between the Experimental and Control Classes ($\mu_E = \mu_K$).
- Alternative Hypothesis Ha: There is a significant difference in the average posttest scores between the Experimental Class and the Control Class ($\mu_E \neq \mu_K$).

Table 12. Independent Sample T-test Results

Welch's t-test calculation	Statistical Value
t-test	6,975
p-value (2-tailed)	1.9×10^{-8} (0.000000019)
Degrees of Freedom (df)	39.52

Decision Criteria: If the p-value < α (0.05), then H0 is rejected. Because the p-value is very small (< 0.05), the Null Hypothesis (H0) is rejected. This means there is a highly statistically significant difference between the average posttest scores of the Experimental Class and the Control Class.

The statistical test results indicate that:

1. The posttest scores of both classes are normally distributed.
2. The variance of the scores of both classes is not homogeneous.
3. There is a significant difference between the average posttest scores of the Experimental Class ($\bar{X}$ = 88.52) and the Control Class ($\bar{X}$ = 69.04).

Building upon the significantly higher and statistically significant difference in average scores, it can be concluded that the treatment given to the Experimental Class had a significant positive effect on student learning outcomes.

Discussion

The results of this study aim to examine the effect of the Think Pair Share (TPS) learning model on student engagement and learning outcomes in science. This study used a post-test-only nonequivalent control group design.

Level of Student Learning Engagement (Questionnaire)

The questionnaire data showed a striking difference in the level of engagement between the experimental class (using TPS) and the control class (without TPS). In the Experimental Class (TPS): (1) The average percentage of student activity reached 78.7%, which is in the High category (range 61%–80%). (2) All students (100%) were in the High or Very High category, with 48.15% in the Very High category (81%–100%) and 51.85% in the High category (61%–80%). Meanwhile, in the Control Class: (1) The average percentage of student activity was 59.9%, which is in the medium category (range 41%–60%). (2) The distribution of students was even, with 50% in the High category and 50% in the medium category. No students reached the Very High category.

The dominance of the High and Very High categories in the Experimental Class indicates that the implementation of the Think Pair Share (TPS) learning model effectively increased student engagement. The TPS model, which promotes individual thinking (Think), pair discussion (Pair), and sharing with the group/class (Share), intrinsically demands student engagement at every stage (Li & Tu, 2024; Sajidan et al., 2024; Sukelasmini, 2019).

Quality of Student Learning Engagement (Observation)

Observation data further corroborates the questionnaire results, providing a detailed picture of the dominant types of activities. Experimental Class (TPS): (10 The majority of activity types (5 out of 7) are included in the Favorable category (76%–100%), with the highest percentages in Listening (93%) and Visual (88%). (2) Motor (72.22%) and mental (74.07%) activities are in the sufficient category, indicating that physical and cognitive processes require further attention, although overall the results of the activities are still considered good. Meanwhile, Control Class: (1) All types of student activities are in the Poor category (<60%). (2) Activities with the lowest percentages (highest priority for improvement) are: Mental (42.30%), Emotional (45.19%), Oral (47%), and Writing (47%).

These results are consistent with the characteristics of the TPS (Teaching and Learning) phase (Nurlaika et al., 2024; Purmiatin & Prameswari, 2025). The increase in listening and visual activity is likely due to the Pair and Share phases, where students must actively listen and observe explanations from peers or other groups. In contrast, the Control Class showed significant weaknesses in all aspects, particularly cognitive (Mental) and communication (Oral and Writing) activities, which are generally under-stimulated in conventional teaching methods.

Student Learning Outcomes (Post-Test)

Descriptive and inferential analysis of the post-test results showed a very significant difference in learning outcomes.

- Average Score: The Experimental Class' post-test average was 88.52 (Very Good Category), significantly higher than the Control Class' score of 69.04 (Fair Category).
- Hypothesis Testing (Welch's t-test): Because the data were normally distributed, but the variance was heterogeneous (p-value = 0.040 < 0.05), the Welch's t-test was used.
  a. The test results showed a t-value of 6.975 with a very small p-value (0.000000019).
  b. Because the p-value < alpha (0.05), the Null Hypothesis (H_0) was rejected.

There was a highly statistically significant difference between the mean post-test scores of the Experimental Class and the Control Class. The rejection of H_0 and the significant mean difference (88.52 vs. 69.04) proved that the Think Pair Share (TPS) learning model had a positive and significant impact on students' science learning

outcomes. This improvement in learning outcomes was directly correlated with increased student activity and engagement, as evidenced by questionnaire and observation data.

Overall, these findings strengthen the argument that the TPS model, by encouraging individual thinking (Think) before discussion and sharing (Pair-Share), successfully improves both the quality of the learning process (engagement/activity) and the quantity of learning outcomes (post-test scores) of State Elementary Madrasah students. The results of this study strongly confirm and extend the positive findings of previous research regarding the effectiveness of the Think Pair Share (TPS) learning model. Previous research, as widely reported in the cooperative education literature, often found that TPS increases student engagement due to the interaction demands during the Pair and Share phases (Ahmad, 2025; Rahmawati & Haeriah, 2023; Samaila et al., 2024). Quantitatively, this study aligns with these findings, showing that the average student engagement in the Experimental Class (TPS) was in the High category (78.7%) compared to the medium category (59.9%) in the Control Class. The strength of this study lies in the detailed observational analysis. The TPS model specifically excelled in stimulating listening (93%) and visual (88%) activities, a finding that supports the hypothesis that the pair and share structure fosters better receptive communication skills. These results indicate that TPS not only increases the quantity of activities but also leads to more focused and purposeful types of activities.

Many relevant studies have concluded that cooperative learning methods have a positive correlation with improved academic learning outcomes (Kaymak et al., 2021; Van Ryzin & Roseth, 2018; Yang, 2023). This study provides very strong statistical evidence. The post-test average of the experimental class was 88.52 (very good), which was significantly higher than the control class's 69.04 (fair). This result was supported by Welch's t-test hypothesis test, which showed a highly significant difference (Standaert, 2018). The average score that reached the Very Good category (88.52) indicated that TPS is a highly effective model, not only improving students' grades to a sufficient level but also capable of driving the highest academic achievement. This strengthens the argument that the process of structured thinking (Think) followed by validation and elaboration of ideas (Pair and Share) can improve conceptual understanding, especially in science lessons (Li & Tu, 2024).

Previous research may have focused more on the general school level. This study makes an important contribution because it was conducted in the specific context of a state elementary school in science subjects. These positive results indicate that the TPS model is highly adaptive and effective in religious education settings, bridging the gap in the literature focused on the State Elementary School context (Pajri et al., 2025; Pohan, 2024). Observational data in the control class showed that students' mental and emotional activity was very low (42.30% and 45.19%, respectively). The success of TPS in bringing these activities to a much higher category in the experimental class proves that this model is a highly relevant intervention for improving the cognitive and affective aspects of students in this environment, who may have previously been understimulated by traditional methods.

4. CONCLUSION

The implementation of the Think Pair Share (TPS) model effectively and significantly increased the level of student learning engagement. The average percentage of student activities in the Experimental Class (TPS) was in the High category (78.7%), while the Control Class was in the Medium category (59.9%). Observational analysis showed that most types of activities in the experimental class were in the "good" category (5 out of 7 activities), with the highest achievements in listening (93%) and visual (88%) activities. In contrast, all types of activities in the Control Class were in the poor category (<60%). In addition, there was a very significant difference in student learning outcomes (post-test scores). This was shown based on the results of the average score of the experimental class, which was 88.52 (very good category), while the control class was 69.04 (sufficient category). The results of the hypothesis test (Welch's t-test) showed the rejection of the Null Hypothesis (H_0) because the p-value was very small (0.000000019), which proved that the TPS model had a significant influence on improving student learning outcomes. Overall, the Think Pair Share (TPS) learning model has proven superior in improving students' science learning activities and outcomes in State Islamic Elementary Schools compared to conventional learning.

As a recommendation, science teachers are advised to integrate the Think Pair Share (TPS) learning model as a primary method, especially for topics requiring in-depth conceptual understanding and discussion, given its proven effectiveness. Schools can offer training or workshops for teachers on how to use cooperative learning models, especially TPS, to make sure that all teachers can use it correctly and to its fullest potential. Further research is needed, focusing on the long-term impact of TPS on material retention and students' intrinsic motivation, not just immediate results (post-test). Furthermore, qualitative studies are needed to explore more of students' perceptions and experiences (especially those with the highest and lowest scores) during the Think, Pair, and Share stages to gain more comprehensive insights into the mechanisms of TPS success.

REFERENCES

Ahmad, R. K. (2025). Enhancing Student Engagement and Performance in Indonesian Language Learning through the Think-Pair-Share (TPS) Model with Question Card Media. *Journal of Education Innovation and Curriculum Development*, *3*(1), 30-37. https://journals.iarn.or.id/index.php/educur/article/view/452

Azizi, F., Wiranda, N., Monnader, N. G., & Morales, U. (2025). Applying the Think-Pair-Share Model to Improve Elementary School Students' Learning Outcomes. *Education Journal*, *1*(3), 107-123. https://journal.zmsadra.or.id/index.php/edunalar/article/view/154

Basdogan, M., & Birdwell, T. (2024). How to design ‘cultivated spaces’ in active learning classrooms: analysis of faculty reflections on learning space. *Learning Environments Research*, *27*(3), 669-689. https://doi.org/10.1007/s10984-024-09496-y

Chuang, S. (2021). The applications of constructivist learning theory and social learning theory on adult continuous development. *Performance Improvement*, *60*(3), 6-14. https://doi.org/10.1002/pfi.21963

Cole, A. W., Lennon, L., & Weber, N. L. (2021). Student perceptions of online active learning practices and online learning climate predict online course engagement. *Interactive Learning Environments*, *29*(5), 866-880. https://doi.org/10.1080/10494820.2019.1619593

Fiqhiyah, F. A., Lestari, I. W., Suwandi, E., & Wafa, K. (2025). Exploring EFL Students' Views on the Implementation of Think-Pair-Share in Reading Comprehension. *Innovations in Language Education and Literature*, *2*(1), 38-47. https://doi.org/10.31605/ilere.v2i1.5251

Ganatra, S., Doblanko, T., Rasmussen, K., Green, J., Kebbe, M., Amin, M., & Perez, A. (2021). Perceived effectiveness and applicability of think-pair-share including storytelling (TPS-S) to enhance clinical learning. *Teaching and Learning in Medicine*, *33*(2), 184-195. https://doi.org/10.1080/10401334.2020.1811094

García-Carmona, A. (2025). Scientific thinking and critical thinking in science education: Two distinct but symbiotically related intellectual processes. *Science & Education*, *34*(1), 227-245. https://doi.org/10.1007/s11191-023-00460-5

Guo, J. P., Yang, L. Y., Zhang, J., & Gan, Y. J. (2022). Academic self-concept, perceptions of the learning environment, engagement, and learning outcomes of university students: relationships and causal ordering. *Higher Education*, *83*(4), 809-828. https://doi.org/10.1007/s10734-021-00705-8

Hartikainen, S., Rintala, H., Pylväs, L., & Nokelainen, P. (2019). The concept of active learning and the measurement of learning outcomes: A review of research in engineering higher education. *Education Sciences*, *9*(4), 276. https://doi.org/10.3390/educsci9040276

Kaymak, S., Kassymbek, Z., Kalamkas, A., & Saydenov, F. (2021). The effect of cooperative learning on students academic achievement. *Management*, *9*(6), 495-503.

Kotsis, K. T. (2025). Optimal STEM educators for elementary school: Students from the Primary Education vs. Science Department. *EIKI Journal of Effective Teaching Methods*, *3*(1). https://doi.org/10.59652/jetm.v3i1.360

Li, M. M., & Tu, C. C. (2024). Developing a project-based learning course model combined with the think–pair–share strategy to enhance creative thinking skills in education students. *Education Sciences*, *14*(3), 233. https://doi.org/10.3390/educsci14030233

Liu, J., Tahri, D., & Qiang, F. (2024). How does active learning pedagogy shape learner curiosity? A multi-site mediator study of learner engagement among 45,972 children. *Journal of Intelligence*, *12*(6), 59. https://doi.org/10.3390/jintelligence12060059

Lombardi, D., Shipley, T. F., & Astronomy Team, Biology Team, Chemistry Team, Engineering Team, Geography Team, Geoscience Team, and Physics Team. (2021). The curious construct of active learning. *Psychological Science in the Public Interest*, *22*(1), 8-43. https://doi.org/10.1177/1529100620973974

Mansir, F. (2022). Integration of islamic science and science in schools: Studies on learning Islamic religious education in the digital era. *TADRIS: Jurnal Pendidikan Islam*, *17*(2), 412-424. https://doi.org/10.19105/tjpi.v17i2.6769

Nasucha, M. R., Khozin, K., & Thoifah, I. A. (2023). Synergizing islamic religious education and scientific learning in the 21st century: A systematic review of literature. *Jurnal Pendidikan Agama Islam (Journal of Islamic Education Studies)*, *11*(1), 109-130. https://doi.org/10.15642/jpai.2023.11.1.109-130

Nurlaika, F., Sahade, S., & Rijal, A. (2024). The Effect of Cooperative Learning Model Type Think Pair Share (TPS) on Student Learning Outcomes. *Golden Ratio of Data in Summary*, *4*(2), 641-653. https://doi.org/10.52970/grdis.v4i2.648

Pajri, S., Sai'dy, S. D., Azizah, N., Saputra, M. I., & Asyha, A. F. (2025). Think Pair Share Strategy Supports Student Engagement in Islamic Education Lessons. *Indonesian Journal of Innovation Studies*, *26*(3), 10-21070. https://doi.org/10.21070/ijins.v26i3.1441

Pohan, K. (2024). Implementation of Think-Pair-Share Type Cooperative Learning Strategy to Improve Understanding of Islamic Religious Education Material in Junior High School Students. *Educationist Journal*, *2*(2), 110-120. https://jurnal.uinsyahada.ac.id/index.php/Educationist/article/view/15440

Purmiatin, A. I., & Prameswari, N. K. (2025). Implementation of the Think Pair Share Model on the Material of Light and its Properties on Students' Critical Thinking Skills. *Journal of Education and Religious Studies*, *5*(02), 60-66. https://doi.org/10.57060/m7ncw086

Rahmawati, H., & Haeriah, H. (2023). Enhancing Student Engagement and Learning Outcomes through the Implementation of the TPS (Think Pair Share) Cooperative Learning Model. *Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, *11*(3), 836-843. https://doi.org/10.33394/j-ps.v11i3.8718

Sajidan, S., Atmojo, I. R. W., Ardiansyah, R., Saputri, D. Y., Roslan, R. M., & Halim, L. (2024). The Effectiveness of the Think-Pair-Project-Share (TP2S) Model in Facilitating Self Directedness of Prospective Science Teachers. *Jurnal Pendidikan IPA Indonesia*, *13*(2).

Samaila, K., Tsong, C. K., Masood, M., & Bervell, B. (2024). Think-pair-share based flipped classroom: A model for improving students' learning achievement and self-efficacy. *Journal of Digital Educational Technology*, *4*(1), ep2410. https://doi.org/10.30935/jdet/14422

Shi, Y., Yang, H., MacLeod, J., Zhang, J., & Yang, H. H. (2020). College students' cognitive learning outcomes in technology-enabled active learning environments: A meta-analysis of the empirical literature. *Journal of Educational Computing Research*, *58*(4), 791-817. https://doi.org/10.1177/0735633119881477

Standaert, F. X. (2018). How (not) to use welch's t-test in side-channel security evaluations. In *International conference on smart card research and advanced applications* (pp. 65-79). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-15462-2_5

Sukelasmini, I. G. A. M. (2019). The implementation of think pair share (TPS) type of cooperative learning model to improve student's motivation and nutrition science learning achievement. *Journal of Education Action Research*, *3*(1), 9-15. https://doi.org/10.23887/jear.v3i1.17081

Susiloningsih, E., Fathurohman, A., Maharani, S. D., Fathurohman, M. F., & Nurani, D. C. (2025). Integration of STEM Approach in Science Education: Enhancing Students' Critical Thinking, Creativity, and Engagement in Elementary Schools in Palembang. *Jurnal Penelitian Pendidikan IPA*, *11*(4), 10-19. https://doi.org/10.29303/jppipa.v11i4.10615

Sutiana, D., & Nugraha, M. S. (2025). Integration of Islamic Values and Science in Islamic Primary Schools: A Philosophy of Science Approach. *Journal of Elementary Education Research and Practice*, *1*(1), 21-34. https://doi.org/10.70376/bv7bqx53

Van Ryzin, M. J., & Roseth, C. J. (2018). Cooperative learning in middle school: A means to improve peer relations and reduce victimization, bullying, and related

outcomes. *Journal of educational psychology*, *110*(8), 1192. https://psycnet.apa.org/buy/2018-08642-001

Yang, X. (2023). A historical review of collaborative learning and cooperative learning. *TechTrends*, *67*(4), 718-728. https://doi.org/10.1007/s11528-022-00823-9

Zaki, A., Sahid, S., Nurhaliza, R., Naufal, M. A., Huda, M., & Hassan, M. N. (2024). Enhancing Mathematical Achievement through the Think-Pair-Share Cooperative Learning Model with Higher-Order Thinking Skills Questions. *Jurnal Riset Pendidikan Matematika*, *11*(2), 106-117. https://doi.org/10.21831/jrpm.v11i2.76963