Effectiveness Of TPS And SGD With Scientific Approach In Terms Of Problem-Solving And Self-Confidence

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Abstract—This study aimed to know the effectiveness of Think Pair Share (TPS) and Spontaneous Group Discussion (SGD) with scientific approach in terms of problem-solving and self-confidence. This study was quasi-experimental with pre-test post-test nonequivalent group design. The population consists of 101 students in grade X MIA MAN 1 Yogyakarta. Its samples were 34 students of X MIA class who gets TPS with scientific approach and 33 students of X MIA 2 class who gets SGD with scientific approach. The instruments were test instrument to measure problem-solving and non-test instrument which consists of scale to measure self-confidence and observation sheet to observe learning process. The results of this study with a significance level $\alpha = 0.05$ were: (1) The first experiment class problem-solving significant value is 0.000, therefore TPS with scientific approach is effective in terms of problem-solving. (2) The first experiment class self-confidence significant value is 0.006, therefore TPS with scientific approach is effective in terms of self-confidence. (3) The second experiment class problem-solving significant value is 0.000, therefore SGD with scientific approach is effective in terms of problem-solving. (4) The second experiment class self-confidence significant value is 0.039, therefore SGD with scientific approach is effective in terms of self-confidence. (5) Significant value of problem-solving comparison is 0.048, therefore TPS with scientific approach is more effective than SGD with scientific approach in terms of problem-solving. (6) Significant value of self-confidence comparison is 0.882, therefore TPS with scientific approach is as effective as SGD with scientific approach in terms of self-confidence.

Keywords: self-confidence, problem-solving, scientific approach, TPS, SGD

I. INTRODUCTION

Science and technology continue to evolve in line with the developments of education. Education consistently develops the potential of the next generation in order to become good human resources. These human resources will gradually create new discoveries which are important for human life. In Indonesia, the importance of a education role is conceived by designing the function and purpose of education [21] written on UU No. 20 of 2003. As an effort to achieve the goal, curriculum was created. The latest curriculum is Curriculum 2013. Curriculum 2013 is focused on character, knowledge, and skill [9]. Curriculum 2013 expects students not to only have a high ability but also cognitive skills and a good attitude or character.

In this curriculum, mathematics is one of the subjects that must be learned by the students. It is because mathematics helps people in developing the technology and science. According to Branca [2] problem solving is the heart of the mathematics. The consequence is students should learn this ability. The problems which are used to train students’ problem solving ability must fulfill two criterias. According Herman Hujodo [5], the criterias are (1) the question should be understood by students but it is still a challenge for them. (2) The question can’t be done by routine steps of problem solving. There are two kinds of problems which are problem to solve and problem to find [18]. In this study, type of the problem is problem to find. Problem solving expects students to follow a series of steps to find a solution. According to Polya [17] the series of steps are understanding, planning, problem solving, and rechecking.

Based on the Curriculum 2013 [9], standard graduation of attitude aspects are faith, nobility, self-confidence, and responsibility in interacting with social and natural environment. Based on this statement, it is known that self-confidence is very important. According to Lauster [10] self-confidence
is an attitude or belief in self-ability so that the actions are not too anxious, feel free to do things as you wish and be responsible for his actions, be polite in their interaction with others, have the drive to recognize the achievements and the advantages and disadvantages. Self-confidence will lead people to achieve their success. In this study, aspects of self-confidence are belief in self-ability, internal locus of control, objective, responsibility, rational and realistic.

There is indication that students’ problem solving ability and self-confidence in Madrasah Aliyah (MA) is not optimal. It is caused by the study load in MA is heavier than common high school. In MA, students not only study about common materials like in formal school but also materials about religion [8]. According to Slameto [16], the study load is one of the reason of the difficulty in learning including problem solving ability and self-confidence. This condition is agreed by student of MAN 1 Yogyakarta. They do not understand well the material because of the study load.

Based on the Regulation of the Ministry of Education and Culture No. 65 year 2013 [12] about the Standard Process, it is stated that the standard of learning in the Curriculum 2013 is using a scientific approach, integrated thematic, and thematic. Scientific approach is choosen to deliver mathematics concept. This approach adopts constructivism in which students are required to build their own knowledge. According to Daryanto [1] the scientific approach is a learning process that leads students to actively develop principles, concepts or laws through scientific steps. These steps are outlined in Regulation of the Ministry of Education and Culture number 81 A 2013 annex IV [13] and Regulation of the Ministry of Education and Culture number 103 2014 [14] which consist of: observing, asking, gathering information, associating and communicating. Thus, scientific approach will assist students in learning mathematics

There are many learning models which have been developed by experts. One of learning models is cooperative learning. According to Spencer Kagan & Miguel Kagan [7] cooperative learning is the most effective model to achieve the learning’s goal. Cooperative learning has also been developed by experts so that there are many types of cooperative learning. Those types include Think Pair Shre (TPS) model and Spontaneous Group Discussion (SGD)

TPS learning models lead students to solve the problem following three steps. Those steps are think, pair, and share. TPS learning model helps the students to solve the problem individually before they discuss in pairs and present the discussion result. This condition improves students’ problem solving ability. According to Fogarty dan Robin [1] TPS learning model trains students to be brave in sharing their idea in front of the class.

SGD learning model leads students to solve the problem following three steps. The steps are grouping spontaneously and variously, discussing the problem, and presenting their discussion’s result as the teacher calls each groups [11]. Conducting SGD learning model is easy because its learning process is simple. The discussion which had been done by five students allowed students to share their ideas each other to solve the problems. SGD learning model has also step of calling all group to present their discussion’s result. It will improve students’ self-confidence.

There is a consideration that TPS and SGD learning model combined with scientific approach can improve students’ problem solving ability and self-confidence. TPS learning model combined with scientific approach leads students to solve the problem following steps of scientific approach in group using TPS model, therefore in the end of learning they discover a new concept of mathematics. SGD learning model combined with scientific approach leads students to solve the problem following steps of scientific that is conducted trivially and spontaneously.

Based on the description above and the potential of the steps in TPS and SGD model combined with scientific approach, it is necessary to conduct a research about the effectiveness of TPS and SGD learning model combined with scientific approach in term of problem solving ability and self-confidence in MAN 1 Yogyakarta.

The problems in this study are described as follows: (1) Is the TPS learning model combined with scientific approach effective in terms of problem solving?, (2) Is the TPS learning model combined with scientific approach effective in terms of self-confidence?, (3) Is the SGD learning model combined with scientific approach effective in terms of problem solving?, (4) Is the SGD learning model combined with scientific approach effective in terms of self-confidence?, (5) Which is more effective between the TPS learning model combined with scientific approach and SGD learning model combined with scientific approach in terms of problem solving?, (6) Which is more effective between the TPS learning model combined with scientific approach and SGD learning model combined with scientific approach in terms of self-confidence?
The purpose of this study are: (1) to describe the effectiveness of TPS combined with scientific approach in terms of problem solving abilities, (2) to describe the effectiveness of TPS combined with scientific approach in terms of self-confidence, (3) to describe the effectiveness of SGD combined with scientific approach in terms of problem solving abilities, (4) to describe the effectiveness of SGD combined with scientific approach in terms of self-confidence, (5) to describe which one is more effective between TPS combined with scientific approaches and SGD combined with scientific approach in terms of problem solving, (6) to describe which one is more effective between TPS combined with scientific approaches and SGD combined with scientific approach in terms of self-confidence.

The benefits of this study for the teachers are (1) getting alternative of learning models to apply the scientific approach, (2) getting reference to improve students’ problem solving ability and self-confidence, (3) helping the teacher in conducting an interactive and effective mathematics learning. The benefits of study for students are: (1) students are able to improve their ability in problem solving, (2) students are able to improve their self-confidence, (3) students are able to improve their ability in sharing their idea. The benefits of this study for researchers is getting direct experience of the researcher as a potential educator in implementing the learning model and its influence in terms of problem solving and students’ self-confidence.

II. METHOD

This research was a quasi-experimental research, a study used to estimate the causal impact of an intervention on its target population. This study was conducted at MAN 1 Yogyakarta, Indonesia, in the first semester of academic year 2015/2016. The material in this study was Sequence and Series. All students in grade X MIA MAN 1 Yogyakarta which consists of 101 students is used as population. The sample consists of two classes which had been chosen randomly with cluster random design. First experiment class was X MIA 3 which consists of 34 students and the second experiment class was X MIA 2 which consists of 33 students. This study used three variables: independent variables, dependent variables, and control variables. The independent variables were cooperative learning model with two variations types; they were Think Pair Share (TPS) learning model and Spontaneous Group Discussion (SGD) learning model. Both of types were combined with scientific approach. The dependent variables in this study were problem solving ability and students’ self-confidence. The control variables in this study were allocation time of learning process, the teacher, and sequence and series material.

The research design which was used in this study was pre-test post-test non-equivalent group design. This design was presented in the following table.

<table>
<thead>
<tr>
<th>First experiment class (E1)</th>
<th>Pretest</th>
<th>TPS combined with scientific approach</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td></td>
<td>Scale</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second experiment class (E2)</th>
<th>Pretest</th>
<th>SGD combined with scientific approach</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td></td>
<td>Scale</td>
<td></td>
</tr>
</tbody>
</table>

Non-test and test instrument were used in this study. The test instrument consisted of pre-test and post-test, each of them consisted of four items. Test instruments were used to measure students’ problem solving ability before and after the treatment. Non-test instrument consisted of a scale of self-confidence and observation sheets. The scales were given before and after treatment to measure students’ self-confidence. Observation sheets were used to observe and record the implementation of the learning models.

The data obtained was analyzed by making a description of the study results and the description of the data which consisted of the early stage descriptions and the end stage descriptions. The early stages descriptions consisted of normality and homogeneity tests. Normality test was performed by using the Kolmogorov-Smirnov test with a significance level α = 0.0. The homogeneity test was performed by using the Leven’s with α = 0.05. The end stage description was hypothesis test. The effectiveness of the learning model test was performed by using one sample t-test, and the comparison between two models test was performed using independent sample t test. The difference average test between two classes had been done to determine whether there are differences of average between them or not. This test has been done using independent sample t test before the comparison test.
The learning model would be effective in terms of problem solving if the value of the post-test students more than or equal to the limit of KKM which was 76. Effective learning model in terms of the student's self-confidence was when the final score of the student's self-confidence was more than 70. It was based on the criteria of student's self-confidence as in Table 2.

### TABLE2. CRITERIA OF STUDENTS’ SELF CONFIDENCE

<table>
<thead>
<tr>
<th>Score interval</th>
<th>Category</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X &gt; \bar{X}_i + 1.8Sbi$</td>
<td>$X &gt; 85$</td>
<td>Very Good</td>
</tr>
<tr>
<td>$\bar{X}_i + 0.6Sbi &lt; X \leq \bar{X}_i + 1.8Sbi$</td>
<td>$70 &lt; X \leq 85$</td>
<td>Good</td>
</tr>
<tr>
<td>$\bar{X}_i - 0.6Sbi &lt; X \leq \bar{X}_i + 0.6Sbi$</td>
<td>$55 &lt; X \leq 70$</td>
<td>Pretty Good</td>
</tr>
<tr>
<td>$\bar{X}_i - 1.8Sbi &lt; X \leq \bar{X}_i - 0.6Sbi$</td>
<td>$40 &lt; X \leq 55$</td>
<td>Less Well</td>
</tr>
<tr>
<td>$X &lt; \bar{X}_i - 1.8Sbi$</td>
<td>$X \leq 40$</td>
<td>Not Good</td>
</tr>
</tbody>
</table>

$\bar{X}_i$ : Ideal Mean $= \frac{1}{2}$ (maximum ideal score + minimum ideal score)

$Sbi$ : Ideal standard deviation $= \frac{1}{6}$ (maximum ideal score – minimum ideal score)

$X$ : Total score

III. RESULT AND DISCUSSION

A. RESULT

1) Data of Problem Solving Ability Score

Pretest and posttests’ mean score of the first experiment class were greater than the second class. However, posttests’ standard deviation of the second experiment class was lower than the first one, but the pretests’ standard deviation was greater than the first class. The complete data of problem solving ability score are shown in Table 3.

### TABLE3. DATA OF PROBLEM SOLVING ABILITY SCORE

<table>
<thead>
<tr>
<th>Description</th>
<th>First Class</th>
<th>Second Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>Mean</td>
<td>48.56</td>
<td>83.38</td>
</tr>
<tr>
<td>Maximum</td>
<td>69</td>
<td>93</td>
</tr>
<tr>
<td>Minimum</td>
<td>31</td>
<td>68</td>
</tr>
<tr>
<td>SD</td>
<td>9.066</td>
<td>5.146</td>
</tr>
<tr>
<td>Variance</td>
<td>82.193</td>
<td>26.486</td>
</tr>
</tbody>
</table>

2) Data of Self-Confidence’s Score

The first and the second class experiment not only got pre-test and post-test but also got scale of self-confidence before and after they were treated. The result had been analyzed. The difference between before and after self-confidence’s scale can be seen in table 4.

### TABLE4. DATA OF SELF-CONFIDENCE

<table>
<thead>
<tr>
<th>Description</th>
<th>First Class</th>
<th>Second Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>Mean</td>
<td>31.06</td>
<td>72.44</td>
</tr>
<tr>
<td>SD</td>
<td>5.898</td>
<td>4.850</td>
</tr>
<tr>
<td>Variance</td>
<td>34.784</td>
<td>23.527</td>
</tr>
<tr>
<td>Maximum</td>
<td>81</td>
<td>83</td>
</tr>
<tr>
<td>Minimum</td>
<td>60</td>
<td>61</td>
</tr>
</tbody>
</table>

Based on table 4, it was found that before treatments’ Mean score of both classes was relative same. However, before treatments’ standard deviation score of first class experiment was lower than the second one. After treatments’ Mean score of both classes was also relative same and before treatments’ standard deviation score of first class was also lower than the second class experiment.

3) Data of Problem Solving Ability
Solving problem in this study was conducted through four steps, they were understanding problem, planning to solve, problem solving, and rechecking the answer. The results of pre-test and post-test which was used to measure students’ problem solving abilities were analyzed on each steps as shown in table 5.

<table>
<thead>
<tr>
<th></th>
<th>Understanding</th>
<th>Planning</th>
<th>Problem solving</th>
<th>Recheck</th>
</tr>
</thead>
<tbody>
<tr>
<td>(E_1)(\text{Pretest})</td>
<td>9.18</td>
<td>6.53</td>
<td>6.53</td>
<td>3.97</td>
</tr>
<tr>
<td>(E_1)(\text{Posttest})</td>
<td>13.03</td>
<td>11.53</td>
<td>10.32</td>
<td>11.79</td>
</tr>
<tr>
<td>(E_2)(\text{Pretest})</td>
<td>9.24</td>
<td>6.21</td>
<td>5.21</td>
<td>3.76</td>
</tr>
<tr>
<td>(E_2)(\text{Posttest})</td>
<td>12.09</td>
<td>11.18</td>
<td>10.48</td>
<td>11.58</td>
</tr>
</tbody>
</table>

Based on table 5, it was found that the ability of students from each step in solving the problem on the first experiment and the second experiment class has increased. The significant increase was seen in rechecking.

B. DISCUSSION

1) Description of Implementation

The learning process both classes were conducted using lesson plan which was created and appropriated to the learning model for each class. Overall, learning process in both of experiment class were appropriate with lesson plan (RPP) which was created.

In TPS with scientific approach class, students do process think, pair, and share. During the think process, students do activities to observe, ask, and collect information that is facilitated using Student Activity Sheet (LKS). They individually think about their answer of the problem which is presented in LKS. After that, they were formed in heterogeneous pairs. The formation of this pair is based on students’ achievement scores before the experiments. During the pairing process, students are discussing about the problems that they had tried to break beforehand. The teacher calls on individuals or pairs to share with the large group in front of the class. Based on the observation, it is known that TPS with scientific approach learning was 97% conducted.

In SGD with scientific learning process, students are directly conditioned for flocking spontaneously and variously on each meeting. They discuss about the problem that is presented in the Student Activity Sheet (LKS). After the students had a discussion, the teacher calls one by one group to present the results of their discussion. Based on the observation, it is known that SGD with scientific approach learning was 96% conducted.

2) Description of Data

a. Normality and Homogeneity Test

Pre-test, post-test and students’ self-confidence after and before treatment on both the experimental class were normally distributed due to the p-value (sig) > \( \alpha = 0.05 \). Homogeneity test results of the pre-test, post-test and students’ self-confidence after and before treatment of the both experiment class are homogeneous. It was because the significant > \( \alpha = 0.05 \).

b. TPS Learning Model Combined with Scientific Approach is Effective in Terms of Problem Solving

In the first experiment class, the treatment given was learning math using TPS with a scientific approach. The effectiveness of learning mathematics using TPS with a scientific approach in terms of mathematical problem solving abilities are based on a minimum predetermined completeness criteria, that is 76. Learning is said to be effective if the average value of problem-solving abilities posttest of first experimental class is equal to or more than 76. Based on analyze using one sample t-test, the significant value is 0.000. This value is less than 0.05. It means that \( H_0 \) was rejected. In brief, Think Pair Share (TPS) learning model combined with scientific approach was effective in terms of problem solving abilities. Think Pair Share (TPS) learning model combined with scientific approach helped the students to solve the problem individually before they discuss in pairs and present the discussion result. Thinking individually led the students to solve the problem with knowledge which they have learned before. During the thinking process, students do activities to observe, ask, and collect information. These three scientific processes help student to improve their ability in understanding and planning the solution from the problem. Scientific approach leads the students to solve problem using steps in scientific approach. During the pair process, students share their answer. They discuss about the best solution for the problem. This condition improves students’ problem solving ability. The
effectiveness of TPS learning was supported by Eny Sulistianingsih [3] in her research that TPS learning model is effective in term of problem solving ability.

c. **TPS Learning Model Combined with Scientific Approach is Effective in Terms of Self-Confidence**

The implementation of TPS with scientific approach was not only seen from the problem-solving ability but also self-confidence of students. The effectiveness of this learning model is based on the value of the category of confidence that is more than 70. Based on analyze using one sample t-test, the significant value is 0.006. This value is less than 0.05. It means that $H_0$ was rejected. In brief, Think Pair Share (TPS) learning model combined with scientific approach was effective in terms of self-confidence. TPS learning model combined with scientific approach leads students to solve the problem confidently. They solve the problem individually and then discuss it with their pair. TPS learning model also facilitates students to share their discussion result in front of the class. This process improves student’s self-confidence. According to Robertson [6], TPS cooperative learning model had many advantages which benefit students. The advantages of questions are increasing belief in the ability of the student. As it has been explained earlier that the belief in the ability of self is one aspect of students’ self-confidence, therefore, the more increase of belief in the ability of student the more increase of students’ self-confidence. The results of this study was also supported by Fadiah Khairina Earth [4], which states that TPS combined with problem-based learning will increase the confidence of students.

d. **SGD Learning Model Combined with Scientific Approach is Effective in Terms of Problem Solving**

In the second experiment class, the treatment given was learning math using SGD with a scientific approach. The effectiveness of learning mathematics using TPS with a scientific approach in terms of mathematical problem solving abilities are based on a minimum predetermined completeness criteria, that is 76. Learning is said to be effective if the average value of problem-solving abilities posttest of first experimental class was equal to or more than 76. Based on analyze using one sample t-test, the significant value is 0.000. This value was less than 0.05. It means that $H_0$ was rejected. In brief, Spontaneous Group Discussion (SGD) learning model combined with scientific approach was effective in terms of problem solving abilities. SGD learning model combined with scientific approach manages students to discuss the problem in group. Each group consisted four or five members. Students followed the instructions in scientific approach to solve the problem. This situation is beneficial for students to practice solving problems by way of discussion. This is in line with the opinion of Tukiran Taniredja, et al. [20], that the benefits of the discussion group is train students to identify, solve problems and make decisions together. The results of this study was also supported by Ratih Damayanti [15], who states that SGD learning models increase students’ activity of solving problem from 17.4 % to 73.91 %.

e. **SGD Learning Model Combined with Scientific Approach is Effective in Terms of Self-Confidence**

The implementation of SGD with scientific approach was not only seen from the problem-solving ability but also self-confidence of students. The effectiveness of this learning model is based on the value of the category of confidence that is more than 70. Based on analyze using one sample t-test, the significant value is 0.039. This value is less than 0.05. It means that $H_0$ was rejected. In brief, Spontaneous Group Discussion (SGD) learning model combined with scientific approach was effective in terms of self-confidence. SGD learning model combined with scientific approach facilitate students to share their idea in group. This process demands each student to take a responsibility to their groups’ members. According to Lauster [19] responsibility is one of the aspects of self-confidence. Its means, if students’ responsibility was improved, the self-confidence will increase. SGD learning model combined with scientific approach also facilitate students to share their result of the discussion in front of the class. This process will also improve students’ self-confidence.

f. **Result of Difference Average Test**

Difference average test had been done to variables after and before treatment. The result of the test is shown in Table 6.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data</th>
<th>Mean</th>
<th>Sig.</th>
</tr>
</thead>
</table>

TABLE6. RESULT OF DIFFERENCE AVERAGE TEST BEFORE TREATMENT
Based on Table 6, it is known that the pre-test and the scale before treatment had significance value more than 0.05 so $H_0$ was accepted. It means there was no difference average between first experiments class and second experiments class in term problem solving ability and self-confidence.

After that, the result of difference average test after treatment is shown in table 7.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data</th>
<th>Mean</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Solving</td>
<td>$E_1$</td>
<td>48.56</td>
<td>0.153</td>
</tr>
<tr>
<td></td>
<td>$E_2$</td>
<td>45.24</td>
<td></td>
</tr>
<tr>
<td>Self-Confidence</td>
<td>$E_1$</td>
<td>71.06</td>
<td>0.812</td>
</tr>
<tr>
<td></td>
<td>$E_2$</td>
<td>70.70</td>
<td></td>
</tr>
</tbody>
</table>

Based on Table 7, it is known that the post-test of problem solving had significance value 0.048. This value is less than 0.05 so $H_0$ was rejected. It means that the average between the both of class experiment in terms of problem solving ability was different. In other word, one of the two learning model is more effective than the other.

The result of self-confidences’ scale after treatment, had significance value is 0.882. This value is more than 0.05 so $H_0$ was accepted. It means that there was no difference between the first and the second experiment class in terms of students’ self-confidence. In other word, TPS learning model combined with scientific approach is as effective as SGD learning model combined with scientific approach in term of self-confidence.

Based on analyze using independent sample t-test, the significant value is 0.048. This value is less than 0.05. It means that $H_0$ was rejected. In other words TPS learning model combined with scientific approach is more effective than SGD learning model combined with scientific approach in term of problem solving ability.

TPS learning model combined with scientific approach helped students to solve the problem individually before they discuss in pairs, but in SGD learning model combined with scientific approach, students directly discuss the problem in group. It is the reason why students get better study’s chance in TPS model. Members of group in TPS learning model combined with scientific approach were less than members of SGD learning model combined with scientific approach. That’s why discussion in TPS learning model is more effective than discussion in SGD learning model. This study was in line with the opinion of TukiranTanureja [20] that the formation of the group will be effective if the number of members is not too much, so there will be no member who just boarded the name.

Based on analyze using independent sample t-test, the significant value is 0.882. This value is greater than 0.05. It means that $H_0$ was accepted. In other words TPS learning model combined with scientific approach is as effective as SGD learning model combined with scientific approach in term of self-confidence. TPS learning model combined with scientific approach leads student to solve the problem confidently. They solve the problem individually and then discuss it with their pair. SGD learning model combined with scientific approach leads student to solve the problem confidently with different members of the group in every different meeting. Both of learning model has sharing process that facilitates students to share their discussion result. This process will improve students’ self-confidence.

IV. CONCLUSIONS AND RECOMENDATIONS

A. CONCLUSIONS

Based on the result, the researchers concluded:
1. Think Pair Share (TPS) learning model combined with scientific approach is effective in terms of problem solving.

2. Think Pair Share (TPS) learning model combined with scientific approach is effective in terms of self-confidence.

3. Spontaneous Group Discussion (SGD) learning model combined with scientific approach is effective in terms of problem solving.

4. Spontaneous Group Discussion (SGD) learning model combined with scientific approach is effective in terms of self-confidence.

5. Think Pair Share (TPS) learning model combined with scientific approach is more effective than Spontaneous Group Discussion (SGD) learning model combined with scientific approach in terms of problem solving.

6. Think Pair Share (TPS) learning model combined with scientific approach is as effective as Spontaneous Group Discussion (SGD) learning model combined with scientific approach in terms of self-confidence.

**B. RECOMMENDATION**

Based on the results of the study, it is recommended to use TPS learning model combined with scientific approach and SGD learning model combined with scientific approach to improve students’ problem solving ability and self-confidence. However, to get better result in improving students’ problem solving ability, using TPS model combined with scientific approach is more recommended.

**REFERENCES**


