

# Implementation of think pair square type cooperative learning to improve collaboration skills in high schools

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## ABSTRACT

*Think Pair Square Style Cooperative Education encourages each student to become a proficient and independent learner. Given that this learning emphasizes 21<sup>st</sup>-century skills such as critical thinking, creativity, and teamwork. It was such as necessary to assess how effectively the application of this method enhances students' critical thinking abilities in the real world. The objective of this project is to improve student cooperation in cell biology classes by implementing a cooperative learning model similar to the Think Pair Square. The classroom action research model was developed by Kemmis and McTaggar, which served as the framework for the procedure employed in this study. The outlines of the four stages of classroom action research are technique—planning, implementation, observation, and reflection. This instructional approach is seen to be beneficial as it enables students to share their thoughts and helps them see alternative problem-solving approaches. Students can seek explanations from other students to explain how to solve the problem if they are struggling with that. From the Data results, there were rising scores in the form of scoring that serve as evidence for this. Students' collaboration skills scored an average of 1.6 (level 1, or basic level) in the pre-cycle, 2 (level 2, or medium level), and 3.56 (level 3, or trained level) in cycle 2. Think Pair Square's implementation at SMA in Bandung could improve collaboration both within and outside of the classroom, foster more active dialogue and idea exchange, and promote student contact.*

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## INTRODUCTION

Education is a process that involves guiding and teaching individuals to mature and become self-sufficient, preparing them for their future lives. In the development of a relevant and sustainable educational process, Miranda et al (2021) assert that the construction of a proposed educational concept in the 4.0 era requires the integration of four key components: competent pedagogical skills, meaningful learning methods, the utilization of information and communication technologies, and supportive infrastructure.

The cooperative learning paradigm is one of several known learning approaches. Cooperative learning is a learning style that employs a grouping/small team system, consisting of four to six people with diverse academic backgrounds, gender, color, or ethnicity (Sanjaya, 2017). Each group member shares equal responsibility for the results to be achieved on the assigned task. Therefore, each member

will help each other, and have motivation for the success of the group, so that each individual will have the same opportunity to contribute to the success of the group. The assessment system is group-oriented and each group will receive an award if the group can demonstrate the required achievements. The cooperative learning model is closely associated with collaboration (Hong et al., 2022).

The Think Pair Square cooperative learning model is a modification of the thinking pair share cooperative learning model developed by Spencer Kagan (Wuryandani & Herwin, 2021). Think Pair Square provides an opportunity for students to discuss their ideas and provides an understanding for them to see other ways of solving problems. If a pair of students cannot solve the problem, then another pair of students can explain how to answer it (Anthony, 2019). In the observations made, there was a significant increase when the think pair share type cooperative learning method was implemented because students were assessed as actively participating in thinking to find problems given by the teacher. Based on data analysis, it is known that student activities in the Civics learning process on the subject of living together in a pluralistic family using the Think Pair Share type cooperative learning method, namely working with tools/media, listening/paying attention to teacher explanations, and sharing discussions between students. The primary activities performed by most students involve working with tools/media, listening, paying attention to teacher explanations, and participating in discussions among students (Kholil et al., 2022).

In addition to enhancing the quality of learning, the think pair share method is also considered effective in improving students' English public speaking skills. Research conducted by (Dewi, 2023) involved data that was analyzed by aggregating scores and calculating percentages. This percentage serves as an indicator of learning, that has been agreed upon by researchers and collaborators with a standard speaking score set as 70. If the target percentage is 90% or more, it means that the application of the Think Pair Share method in conveying opinions was successful. Through data analysis, it was revealed that the percentage of student activity increased from 72% in cycle 1 to 100% in cycle 2. Meanwhile, teacher activity also increased from 75% in cycle 1 to 97.5% in cycle 2 (Dewi, 2023).

The think pair share method has evolved into the Think Pair Square method. (Rochmawati et al., 2017) stated in the results of their research that cooperative learning is able to give birth to new branches which makes the learning method dynamic, meaning it is able to give birth to various branches of learning methods due to several factors. One of the factors that influences the most is the student's education level and age. Simple cooperative learning is usually only implemented with young children aged 5 to 6 years. However, cooperative learning will be more diverse and of course at a higher level for students who are already at the upper secondary education level. One of them is the development of cooperative learning from think pair share to Think Pair Square where interaction occurs in groups of 4 people. As a result, student activities can be classified as active and tend to be efficient (Dewi, 2018). Think Pair Square type cooperative learning is used to improve the ability to think, communicate, and encourage students to share information with other students, as well as streamline everything, both time, energy, and effort needed to solve a problem in learning (Irianto, 2020).

The main objective of this research is to assess and comprehend the impact of implementing the Think Pair Square type cooperative learning model on enhancing students' collaboration skills in High Schools within Bandung City. Initially, this research aims to measure the level of student collaboration skills before implementing the Think Pair Square model. Through these measurements, research will identify specific areas that require special attention in the development of collaborative skills. Secondly, this research aims to analyze the impact of implementing Think Pair Square-type cooperative learning on enhancing student collaboration skills in High Schools within Bandung City. By comparing the results before and after implementation, this research will provide an in-depth understanding of the effectiveness of the cooperative learning model. Third, this research aims to provide a holistic evaluation of the effectiveness of Think Pair Square-type cooperative learning in the school environment. By assessing the extent to which this model can result in improved collaboration skills, this research will contribute to understanding the use of learning models that suit contemporary needs. Finally, this research also aims to develop recommendations that can become the basis for developing a Think Pair Square type cooperative learning model in Bandung City High Schools, as well as providing guidance for other schools in improving learning strategies that focus on improving students' collaboration skills. Thus, it is hoped that this research can make a real contribution to enriching learning practices at the high school level and support the fulfillment of today's educational needs which require mastery of collaboration skills, especially in Biology subjects.

## METHOD

This research procedure employs a classroom action research procedure which was carried out over two cycles through a collaborative work process with High School biology teachers from Bandung City and with PPG colleagues where classroom action research was implemented in cell material biology subjects. The classroom action research was implemented in the biology subject and adopted the PTK model from Kemmis and Mc. Taggart. According to Kemmis and Mc Taggart (Tyera et al., 2022), the classroom action research procedure consists of four stages; planning, acting, observing, and reflecting.

This research was carried out at Bandung City High School during the odd semester of the 2023-2024 academic year. The research subjects included all students in class XI MIPA 1 SMA Bandung City, with a total of 33 students consisting of 19 women and 14 men. The data collection method employed in this research utilized an observation sheet as an instrument. According to (Sugiyono, 2019) the observation sheet instrument is a tool designed to obtain data about the conditions of implementation of the mathematics learning process through the Think Pair Square type cooperative learning model for both student and teacher activities; self-assessment questionnaires and peer assessments as a practicum to evaluate of students' collaboration abilities before receiving treatment. Collaboration indicators, following Zhang & Li (2016) include active contribution, productive teamwork, flexibility, compromise, responsibility, and a respectful attitude. These indicators were further developed into 12 aspects that were observed to become the basis for observation sheets and questionnaires. Collaboration skills criteria are based on reference assessments as in Table 1.

**Table 1.** Criteria for Student Skill Percentage

Score	Category
>80	Very collaborative
>60-80	Collaborative
>40-60	Quite collaborative
>20-40	Less collaborative
<20	Not collaborative

(Source Ministry of Education and Culture (2018))

Based on the value of each student's collaboration skills, the average student score will be categorized according to Greenstein. The Rubik used employs a scoring scale consisting of four scales, as outlined in Table 2.

**Table 2.** Criteria for average student collaboration skills

Skor	Category
1.0 – 2.7	Level 1: basic level
2.8 – 3.1	Level 2: medium level
3.2 – 3.5	Level 3: trained level
3.6 – 4.0	Level 4: high level

(Greenstein dalam Saenab, 2019)

The data results from the student collaboration skills observation sheet are summarized using a benchmark assessment. Values are obtained from the results of the recap of the student collaboration skills observation sheet and then the values obtained are categorized.

**Table 3.** Recapitulation of pre-cycle and cycle scores

Component	Pre-cycle	Cycle 1	Cycle 2
Highest score	2,35	2,5	4
Lowest score	1,45	1,7	3
Average	1,6	2	3,56
Category	Level 1	Level 2	Level 3

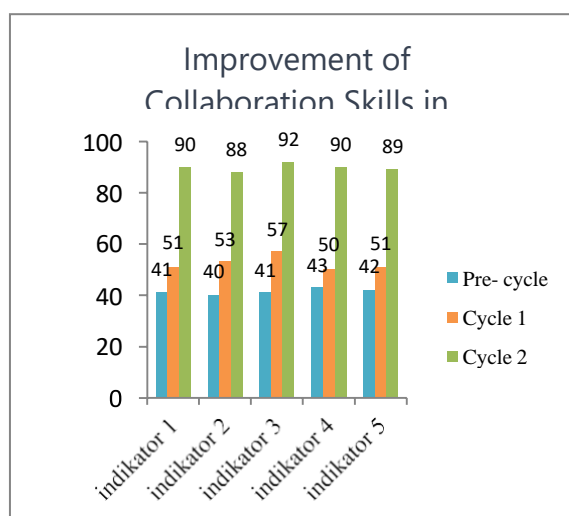
## RESULTS AND DISCUSSION

After implementing the Think Pair Square type cooperative learning activity procedure by adapting the four learning phases according to Ali (2021), results were obtained indicating a significant Improvement in students' collaboration abilities from various indicators. These results can be seen in Figure 1 which consists of three cycles and five indicators.

According to the percentage calculation presented in Figure 1, it shows that there is an improvement in students' collaboration abilities. The graph demonstrated an upward trend in cycle 2, which based on the percentage category grouping shows that it is very collaborative because it is at a value above 80%. Specifically, in indicator 1 regarding active contribution, there was an increase of 39% from cycle 1 to cycle 2. For indicator 2, regarding working productively, there was an increase of 35%. Similarly, Indicator 3, regarding showing flexibility and compromise also increased by 35%. Meanwhile, indicator 4 regarding responsibility has increased by 40%. Additionally, the final indicator regarding showing respect has increased by 38%. This increase occurs because the Think Pair Square type cooperative learning model can train students' collaboration skills. Tabrani & Amin (2023) state that Think Pair Square type cooperative learning is a model that requires students to

think in pairs and groups of fours and gives each student more opportunities to show their participation to other students. The positive outcome observed in the research indicates meeting the criteria of success. This is in line with the results of research conducted by [Kholil et al \(2022\)](#) where there was an increase in all indicators of student collaboration in both cycle 1 and cycle 2 and had reached the criteria of success. Using a model is the right choice because the Think Pair Square model allows students to discuss their ideas and provides an understanding for them to see other ways of solving problems. If a pair of students cannot solve the problem, then another pair of students can explain how to answer it ([Suci, 2018](#)).

**Figure 1.** Percentage increase in student collaboration skills according to indicators



**Information**

Indicator 1: Contribute actively

Indicator 2: Work productively

Indicator 3: Flexibility and compromise

Indicator 4: Responsibility

Indicator 5 : Appreciative attitude

In addition from the learning methods carried out, the teacher as the main controller must be able to think further to develop and choose procedures and ways so that the teaching and learning activities carried out can make students comfortable. This is in line with the influence of internal factors; the way teaching and learning activities are carried out, whether teaching and learning activities for this type of Think Pair Square can only be carried out face to face, or can also be carried out virtually ([Ho et al., 2021](#)).

The direct method makes students a very high sense of curiosity and initiative. This is in line with the results of research conducted by [Scanniello & Erra \(2014\)](#) believe that the factor that can be a variable in determining student comfort and satisfaction in the teaching and learning process using the Think Pair Square type cooperative learning method is where the activity is carried out. It is stated that activities carried out in the classroom, face to face, will increase students' interest so that students' initiative and enthusiasm are greater, which will influence the level of success of teaching

and learning activities where this success has one indicator, namely an increase in critical thinking skills. and find solutions to every problem given to students (Harefa et al., 2022).

Finally, a proficient teacher plays a crucial role in supporting cooperative teaching and learning activities by providing opportunities for students to express their knowledge either through presentations, question-and-answer methods, or simply discussing a problem so that not only the ability to collaborate is trained, but also the ability to critical thinking that improves (Saihu, 2022).

## CONCLUSION

According to the research findings, students' teamwork skills experience significantly growth during the learning process. This demonstrates that the think-pair-square collaborative learning paradigm helps increase students' teamwork abilities. This study gives tangible proof that employing this method can be a successful strategy for fostering improved collaboration skills among students during the learning process. Well-developed cooperation skills empower students to actively engage in laboratory experiments, cooperative scientific projects, and group debates, all essential components for advancing scientific knowledge.

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