

The Influence of the TPS Type Cooperative Learning Model Assisted by Integrated PPT Media on High School Students' Collaboration Skills

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Abstract

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21st century skills are important for schools as educational institutions. One of the 21st century skills that can be developed and achieved by students in learning activities is collaboration skills. Collaboration skills are very important in learning at school, one of which is in physics learning. Collaboration skills can be achieved with learning models and media used in the learning process. However, not all learning processes can improve students' collaboration skills. This study aims to examine the effect of the TPS type cooperative learning model assisted by integrated PPT media on the collaboration skills of high school students. This research method uses True Experimental with a Posttest Only Control Group Design design consisting of an experimental class treated with the TPS type cooperative learning model assisted by integrated PPT and a control class using the Problem Based Learning (PBL) learning model. The sampling of this study used the cluster random sampling technique and if after the Levene's test the data was not homogeneous, then the value between classes with the smallest difference was used. Analysis of the research data used SPSS 25 with a normality test, and an independent sample t-test hypothesis test if the data was normal or a Mann-Whitney U test if the data was not normal. The results of the study showed that collaboration skills with an Asymp value. Sig. (2-tailed) of 0.045, which means there is a difference between the experimental class and the control class. So it can be concluded that the TPS type cooperative learning model assisted by integrated PPT media has a significant effect on the collaboration skills of high school students.

Keywords: *TPS Type Cooperative Learning Model, Integrated PPT, Collaboration Skills*

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INTRODUCTION

21st century skills are important for schools as educational institutions. These skills include 4C, namely creative thinking skills, critical thinking and problem solving, communication, and collaboration (Septicasari and Frasandy, 2018). In learning, students can develop and achieve one of the 21st century skills, namely collaboration skills.

Collaborative skills are a learning strategy that emphasizes students collaborating in small groups to optimize individual and group learning activities (Le et al., 2018). Law et al. (2017) explained that collaborative skills can be improved through cooperative learning. According to Ventista (2023), teachers use audio media such as radio and visual media in the form of power points containing images and video animations as a means to improve students' collaborative skills.

Indicators of collaborative skills include active contribution, working productively, being responsible, flexibility and compromise, and mutual respect (Dhitasarifa *et al* ., 2023). Collaborative skills are very important in learning at school, one of which is in physics learning.

Physics learning is a way to understand and solve natural phenomena problems using natural science and technology. Based on these factors, one variation of the learning model to improve students' collaboration skills is to use the TPS type cooperative learning model. The TPS type cooperative learning model is a strategy that focuses on thinking activities, exchanging opinions and supporting each other between students in groups (Sukadana, 2022). Budiyanto (2016) explains the stages of the TPS cooperative learning model including the *think stage* (thinking) including the teacher's activities presenting problems and helping students find solutions by thinking independently, the *pair stage* (pairing) with the teacher's activities directing students to collaborate and guide them in reviewing the ideas that have been obtained, and the *share stage* (sharing) with the teacher's activities directing students in pairs to share the results of their discussions in class. The advantages of the TPS learning model can trigger active student involvement in the learning process in small groups, increase students' thinking power, students have time to think in responding to other students, students find it easier to understand learning during discussion activities, learn from each other with other students and have the opportunity to share their ideas each (Nurussofi *et al.*, 2022). The limitations of the TPS type cooperative learning model include taking up learning time due to the large number of groups, fewer ideas emerging, and the need for teachers to intervene optimally with students (Sujarwanto, 2022:6). Due to the shortcomings of the TPS type cooperative learning model, effective media are needed to support the learning process.

Integrated PPT media is one of the learning media with the delivery of material accompanied by interesting forms and images, so that it can bring up students' ideas, and students do not get bored in learning. In addition, PPT in front of the class can reach all students in the class, thus minimizing the time wasted in learning activities. Integrated science learning is learning that includes science disciplines, skills, attitudes and characters, culture, and includes three dimensions in the form of attitudes, processes and products (Wilujeng, 2018). Integrated PPT media is a Power Point learning media combined with other media such as PhET media, Virtual Lab, Wordwall, O'Physics and so on. According to Zaenal (2020), collaboration skills can be improved through the TPS cooperative learning model and media in learning.

Sa'diyyah *et al.* (2024) explained that when students work in groups, only 1 to 2 students work. So that student cooperation and interaction in groups and student communication are considered lacking and make students' collaboration skills low. In addition, Sidi (2020) explained that students who are accustomed to studying alone using text-based media have low teamwork skills. Researchers also conducted interviews and observations at one of the high schools in Jember and found that the learning model that is often applied uses a problem-based learning model through lecture and discussion methods. The media used by teachers mostly still use LKS. Students interact less with their friends discussing the material given by the teacher, which results in students' collaboration skills still being less than

good. The learning models and media used are often the same, so students are less enthusiastic about learning. Based on this, it can be concluded that a learning model and media are needed that can improve students' collaboration skills. Therefore, this study aims to examine the effect of the TPS type cooperative learning model assisted by integrated PPT media on the collaboration skills of high school students.

RESEARCH METHOD

The study was conducted in the even semester of the 2024/2025 academic year in January at a high school in Jember. The population of this study were grade XI students of a high school in Jember. This study used a cluster random sampling technique if after being tested for homogeneity with the Levene's test, uniform data was obtained. However, if the data obtained was not uniform, the selection was based on the value between classes with the smallest difference. The samples used consisted of samples from the experimental class and the control class.

This research is part of a quantitative approach with the *True Experimental research method of the Posttest Only Control Group Design* pattern . Table 1 shows *the Posttest Only Control Group Design research design* .

Table 1. *Posttest Only Control Group Design*

Learning Group	Learning model	Posttest Results
G ₁	X	O ₁
G ₂	-	O ₂

(Ismail, 2018).

Information:

G₁ : experimental class

G₂ : control class

O₁ : *posttest results* of experimental class

O₂ : *posttest results* of control class

X: treatment with the TPS type cooperative learning model assisted by PPT integrated

- : not given treatment (with the learning model usually applied in school)

This study uses observation, interview, documentation, test, and questionnaire methods as data collection methods. The questionnaire stage is used to obtain data on students' collaboration skills in the form of a closed questionnaire. The questionnaire contains statements according to the indicators of collaboration skills and is carried out after treatment is given in class. In this study, the statements used in the questionnaire are positive statements. The Likert scale is used in the questionnaire assessment and in Table 2 below are the categories of collaboration skills assessment.

Table 2. Collaboration skills questionnaire assessment categories

Category	Meaning of Statement	
	Positive	Negative
Strongly agree	5	1
Agree	4	2
Doubtful	3	3

Don't agree	2	4
Strongly Disagree	1	5

(Islamiati *et al.*, 2023)

The research data is in the form of collaboration skills questionnaire data and supporting data in the form of observation sheets. The questionnaire and posttest data were then analyzed using statistical tests using *SPSS 25 software*. The statistical test procedure uses normality tests and hypothesis tests. If the results of the normality test show that the data is normally distributed, the analysis uses the *independent sample t-test hypothesis test*. However, if the data is not normally distributed with the *Mann-Whitney U test hypothesis test*. The hypothesis of this study is the influence of the TPS type cooperative learning model assisted by integrated PPT media on the collaboration skills of high school students.

RESEARCH RESULTS AND DISCUSSION

This study took place at SMA Negeri Arjasa Jember in the even semester of 2024/2025, the population included all students in grade XI. The study was conducted from 13 to 21 January 2025. Levene's homogeneity test with *SPSS 25* showed heterogeneous data, so sample selection was carried out with the smallest difference between class values. Based on the daily summative value data of students, it was obtained that from class XI IPA 1 to class XI IPA 4, the smallest average difference was found between class XI IPA 4 and XI IPA 3. So that XI IPA 4 is the experimental class and XI IPA 3 is the control class. In the experimental class, each group consists of 2 students, while the control class consists of 6 students. The learning process of the experimental class with the TPS type cooperative learning model assisted by integrated PPT media. While in the control class with the learning model that is usually applied in schools or the *Problem Based Learning* (PBL) learning model.

Collaboration skills data were obtained from a collaboration skills questionnaire completed by students at the end of the lesson session in both the experimental class with 34 students and the control class with 31 students. After the data was obtained, the *Shapiro-Wilk normality test* was carried out because the sample was less than 50 for each class. The normality test showed that the significance value (Sig.) of students' collaboration skills in the experimental class was recorded at 0.012. The data is not normally distributed because the value is below 0.05. The Significance Value (Sig.) of the control class collaboration skills is recorded at 0.130 indicating a normal distribution because it is greater than 0.05. Because one group of data is not normally distributed, a *Mann-Whitney U test* is then carried out. The results of the *Mann-Whitney U test* can be seen in Table 3 below:

Table 3. Results of the *Mann-Whitney U test* for collaboration skills data.

Collaboration Skills Value	
Mann-Whitney U	375,000
Wilcoxon W	871,000
Z	-2.003
Asymp. Sig (2-tailed)	.045

According to the principle of the Mann-Whitney U test, if the significance value (Asymp. Sig. (2-tailed)) < 0.05 indicates a difference. If the significance value (Asymp. Sig. (2-tailed)) ≥ 0.05 indicates no difference. Based on the results of the Mann-Whitney U test Asymp. Sig. (2-tailed) the value was 0.045. This value is below 0.05 indicating a significant difference. So the research hypothesis proves that there is an influence of the TPS type cooperative learning model assisted by integrated PPT media on the collaboration skills of high school students. In accordance with Sunarti et al. (2023) explains that collaboration skills can be increased through the TPS learning model. In addition, Abdullah and Nasution (2024) also explained that using integrated PPT media can make a significant contribution to the development of students' collaboration and communication skills.

The influence of the TPS type cooperative learning model assisted by integrated PPT media on students' collaboration skills can also be seen from observer data. This study used three observers to assess collaboration skills in the experimental and control classes. The categories of collaboration skill acquisition are shown in Table 4 below.

Table 4. Categories and percentages of collaboration skills

Percentage (%)	Category
$80 < X \leq 100$	Very good
$60 < X \leq 80$	Good
$40 < X \leq 60$	Enough
$20 < X \leq 40$	Not enough
$0 < X \leq 20$	Very Less

(Ambarwati, 2024).

Recapitulation of observation data on collaborative skills of the experimental class at each meeting obtained an average increase in students' collaborative skills at each meeting. Students try to adjust to the learning process at the first meeting. Although working in groups, some students still answer assignments individually. At the 2nd meeting, students began to interact more often with their friends and solve problems in groups, so that at the 3rd meeting, students began to get used to the learning process. While in the control class indicated a decrease in the average in the 2nd meeting because students were more accustomed to the learning process. Some students often did not follow the learning process or talked outside the material given with other friends so that problem solving was completed by 1 to 3 students in their group. In addition, students' collaborative skills are also explained for each indicator. The percentage of students' collaborative skills can be summarized by the graph in Figure 1.

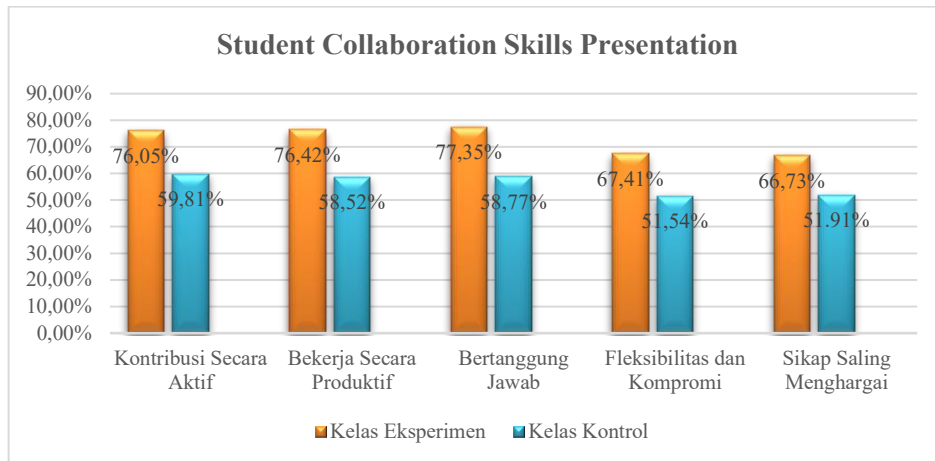


Figure 1. Graph of percentage of students' collaboration skills

According to Figure 1. it is explained that the percentage of collaborative skills of experimental class students is superior to the collaborative skills of control class students. Collaboration skill indicators include active contribution, working productively, being responsible, flexibility and compromise, and mutual respect. The collaborative skills of the experimental class obtained a percentage of 76.05% with a good category on the active contribution indicator, 76.42% with a good category on the productive work indicator, 77.35% with a good category on the responsible indicator, 67.41% with a good category on the flexibility and compromise indicator, and 66.73% with a good category on the mutual respect indicator. The order of the percentage of experimental class collaboration skill indicators from highest to lowest is responsible, working productively, active contribution, flexibility and compromise, and mutual respect.

The indicator “responsible” is the indicator with the highest percentage in the experimental class because students have a desire to solve problems given by the teacher. Students feel that students' responsibility is greater when solving problems with a few members in a group than with several members in a group. In addition, students feel that solving problems given by the teacher can provide students with knowledge and understanding and can add value to physics subjects. The indicator “attitude of mutual respect” is the indicator with the lowest percentage value in the experimental class because students feel close to their friends so that students behave according to their own wishes and some students cannot accept opinions from their friends.

Collaboration skills in the control class on the active contribution indicator obtained a percentage of 59.81% and were categorized as sufficient. The indicator of working productively obtained a percentage of 58.52% and were categorized as sufficient. On the responsible indicator, the percentage was 58.77% and were categorized as sufficient. The flexibility and compromise indicator obtained a percentage of 51.54% with a sufficient category and on the category of mutual respect, the percentage was 51.91% with a sufficient category. The order of the percentage of control class collaboration skill indicators from the highest to the lowest is active contribution, responsible, working productively, mutual respect, and flexibility and compromise.

The indicator of “active contribution” is the indicator with the highest percentage value in the control class because in one group several students participate in solving the problem even though there are 3 to 4 students who are less focused on solving the problem. In addition, there are students who only follow their friends' answers in solving the problem and are less able to provide solutions to solve the problem. The indicator of “flexibility and compromise” is the indicator with the lowest percentage value in the control class because several students still seek answers from other groups or even ignore the problem-solving process and talk outside the material with their friends. The percentage of the control class collaboration skill indicator does not exceed the percentage of the collaboration skill indicator in the experimental class. This shows that the TPS type cooperative learning model assisted by integrated PPT media has a good effect on students' collaboration skills.

Based on the constructivist learning theory underlying the TPS type cooperative learning model, it explains that students can find knowledge because of their own activeness (Aje, 2022). Researcher Suprapti (2018) explains that the application of constructivist learning theory through the TPS type cooperative model can improve student learning outcomes. This model also inspires students to work together, communicate in groups and provide solutions to existing problems.

CONCLUSION

Based on the results and discussion, the conclusion that can be drawn is that after the collaboration skills data was tested for *Shapiro-Wilk* normality, the value (Sig.) of students' collaboration skills in the experimental class was recorded at 0.012. While the Significance value (Sig.) of the control class's collaboration skills was recorded at 0.130. Because one group of data was not normally distributed because the value was below 0.05, a *Mann-Whitney U test* was then carried out. The results of the *Mann-Whitney U-test* showed an Asymp. Sig. (2-tailed) value of 0.045 below 0.05 indicating a significant difference. So it can be concluded that there is an influence of the TPS type cooperative learning model assisted by integrated PPT media on the collaboration skills of high school students. In addition, through observation, it was found that the percentage of the control class collaboration skills indicator did not exceed the percentage of the collaboration skills indicator in the experimental class. So it shows that the TPS type cooperative learning model assisted by integrated PPT media has a good effect on students' collaboration skills.

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