



## The Effect of Problem-based Learning on Students Collaboration Skills in Islamic Boarding Schools

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**Abstrak:** Collaboration skills are one of the skills required to be developed in 21st-century education. This study aimed to determine the effect of implementing the problem-based learning (PBL) model on the collaboration skills of Islamic boarding school students. This research is a quasi-experimental study using a non-equivalent pretest-posttest control group design. This research was conducted at MA Miftahul Ulum Bettet Pamekasan, even semester of the 2021/2022 academic year. Collaboration skills data was collected through observation sheets and then analyzed using the t-test to determine differences in collaboration skills in the control and experimental group. The results showed that the implementation of PBL in learning could improve the collaboration skills of Islamic boarding school students (Sig. <.05). The results of this study indicate that the PBL learning model can be used as a reference for learning models to develop students' collaboration skills.

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## INTRODUCTION

Education is one measure of the progress of a nation. Education is expected to provide competence to society in accordance with current developments (Karnegi & Iswahyudi, 2021). The importance of education is expected to be realized by the people of Indonesia so that they can face the future, especially in the era of the industrial revolution 4.0, to compete with developed countries worldwide. The industrial revolution 4.0 demands education to produce students who can compete in the future (Marheni & Suardana, 2017). TIMSS (The Trends in International Mathematics and Science Study) 2021 reveals that Indonesian student achievement is ranked 36th out of 40 participating countries. This shows that the achievement of Indonesian students is still in the low category. 21st-century education demands skills development with the 4C framework: collaboration, communication, critical thinking, creativity and innovation.

Collaboration skills are one of the skills that need to be developed in the 21st century. Collaboration is a form of social interaction through cooperation to achieve common goals by helping and understanding each other's tasks (Dew, 2020). STEM (Science, Technology,

Engineering, Math) defines collaboration as student cooperation in heterogeneous groups to achieve common goals. Collaboration skills are not only working in a group but also having to create cohesive group work. Cohesiveness refers to the extent to which group members are attracted to each other, feel part of the group members, provide input, and respect each other's opinions (Yuniar et al., 2018). Previous research has proven that students will learn better if they are actively involved in the learning process in small groups (Frasandy, 2018). This activity helps students tend to learn more and helps students remember the subject matter longer; therefore, students need to be encouraged to collaborate with their classmates.

The survey results at MA Al-Islamiah 1 Sumber Batu Pamekasan show that students are not used to collaborating in-class learning. This is evidenced by the activities of students in the classroom that are still limited to passively listening to the teacher's explanation. This shows that no learning process provides opportunities for students to study in groups or exchange ideas in group discussions. One effort to solve the problems above is to present effective learning to empower students' collaboration skills through the Problem-Based Learning (PBL) model. PBL is a learning model that trains students to develop higher-order thinking skills and authentic problem-solving abilities in student life (Pramitha & Wahjudi, 2020). PBL not only presents facts but can also develop critical thinking and problem-solving skills and students' knowledge (Dewi & Jatiningsih, 2015).

Previous research revealed that the PBL model significantly affected students' collaboration skills (Gholami et al., 2019). Other findings also indicate that the PBL model increases the potential for student collaboration skills (Ilmiyatni et al., 2019; Fitriani et al., 2020; Riskayanti, 2021). The research results above are incomplete because the PBL model has not been widely implemented in Islamic boarding school students. Therefore, implementing the PBL model in Islamic boarding schools needs to be done to obtain a comprehensive picture of the influence of the PBL model, especially on student collaboration skills.

## RESEARCH METHOD

This research is a quasi-experimental study (Gopalan et al., 2020) with a non-equivalent pretest-posttest control group design (Campbell & Stanley, 2015). The subjects of this study were students of class X IPA B and class X IPA C at MA Miftahul Ulum Bettet Pamekasan, even semester of the 2021/2022 academic year. Class X C is the control class with 20 students, while X B is the experimental class with 24 students. A random sampling technique was used (Kadilar & Cingi, 2006). Student collaboration skills are measured using observation sheets. The observer filled out the collaboration skills observation sheet using a rubric developed by Hermawan et al (2017) which covered five aspects: contribution, time management, problem-solving, working with others, and investigative techniques. Measurements are made by scoring 1-4 for each student according to the indicators of each aspect. Student collaboration skills are measured at each class meeting. Data analysis used inferential statistics using the t-test (Gerald, 2018) using SPSS 25.00 for Windows (Field, 2005).

## RESULTS AND DISCUSSION

To determine the effect of the PBL model on students' collaboration skills, a t-test was carried out in the experimental and control classes. The hypothesis test is preceded by the normality and homogeneity prerequisite tests shown in Table 1.

Table 1. Test for normality and homogeneity

|                     | Kolmogorov-Smirnov <sup>a</sup> |    |       | Levene Tes |     |     |      |
|---------------------|---------------------------------|----|-------|------------|-----|-----|------|
|                     | Statistic                       | df | Sig.  | F          | df1 | df2 | Sig. |
| Residual<br>for YLS | .105                            | 40 | .200* | .697       | 1   | 38  | .409 |

Table 1 shows the Sig. for normality and homogeneity tests > .05 (.200 and .409). Based on these results, the collaboration skills data is normally distributed and has a homogeneous variance. After the prerequisite tests were met, a t-test was carried out to determine the differences in students' collaboration skills in the two experimental classes. The results of the t-test are shown in Table 2.

Table 2. Results of the t-test of students' collaboration skills

|               |                                  | F    | Sig. | t      | df     | Sig.<br>(2-tailed) | Mean<br>Difference | Std. Error<br>Difference |
|---------------|----------------------------------|------|------|--------|--------|--------------------|--------------------|--------------------------|
| Collaboration | Equal variances assumed          | .243 | .625 | -4.864 | 42     | .000               | -24.72500          | 5.08331                  |
|               | Equal variances are not assumed. |      |      | -4.880 | 41.044 | .000               | -24.72500          | 5.06706                  |

Table 2 shows that the Sig. < .05. This indicates that the collaboration skills of students in the control and experimental classes, where the collaboration skills of students in the experimental class are higher than the control class. These results prove that the PBL model significantly affects the collaboration skills of class X students of MA Miftahul Ulum Bettet Pamekasan.

This study's results align with previous research, which revealed that the PBL model significantly affected students' collaboration skills (Saenab et al., 2019). This study also revealed that the results of collaboration data analysis obtained in the experimental class (PBL) were higher than the control class. This reinforces that the PBL model can improve students' collaboration skills (Jalmo et al., 2019; Wela et al., 2020). Other research also revealed that students' collaboration skills in the experimental group were better than the control group (Ilmiyatni et al., 2019). PBL increases student engagement by enabling knowledge, information sharing, and discussion (Almulla, 2020).

Other research reveals that students' collaboration skills can be improved through the implementation of the PBL model. So that the PBL model can be used to empower students' collaboration skills in the 21st century (Santika et al., 2020). Furthermore, the results of the data analysis showed that the 4C skills of students taught using the PBL model were better

than conventional learning. The percentage of increase in N-gain in student collaboration skills is 75.40% in the high category (Kurniawati & Hidayah, 2021). The results of this study are also in line with the main principles of PBL: authentic real-life problems; active engagement of students through research, decision-making, and writing activities; high degree of autonomy and responsibility for self-study; and group and collaborative work (Ryberg, 2019).

The results of this study are relevant to student activities in each PBL syntax. The PBL syntax in the problem orientation phase shows that students in groups observe and understand the problems presented by the teacher or obtained from suggested reading materials. In the student organization phase of learning, students discuss and divide tasks to find data/materials/tools needed to solve problems. In the group investigation phase, students conduct investigations (looking for data/references/sources) for group discussion material. In the phase of developing and presenting results, the group holds discussions to produce solutions to problem-solving that are shown in the form of works. In the problem-solving analysis and evaluation phase, each group makes a presentation, and the other groups give their appreciation. Finally, the activity is continued by summarizing or making conclusions according to the input obtained from other groups (Arends, 2008).

Collaboration skills are identified as critical educational outcomes because they are one of the four main concepts of 21st-century learning. In addition, collaboration can also increase students' sense of responsibility and cooperation. This indicates that 21st-century education currently requires students to have collaboration skills. Furthermore, the implementation of PBL in Islamic boarding school-based schools with the characteristics of passive student learning habits can spur student collaboration skills.

## CONCLUSIONS

Implementing PBL in the learning process can improve students' collaboration skills at the Islamic boarding school MA Al-Islamiyah I Sumber Batu Pamekasan. To get more comprehensive results related to the implementation of PBL in schools, several things can be considered: researchers should consider students' readiness for research, especially study habits, and teachers or researchers must master the learning model used.

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