

Implementing STAD and PBL to Improve Learning Outcomes in History Classes at Teuku Umar High School, Semarang

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ABSTRACT

An instructional model that matches students' characteristics is an important factor in improving learning outcomes. The Cooperative Learning model of Student Teams Achievement Division (STAD) and Problem Based Learning (PBL) are learning models that can increase students' engagement and understanding during the learning process. This study aims to analyze the effect of the implementation of STAD and PBL on the learning outcomes of tenth-grade students in history subjects at SMA Teuku Umar Semarang. This research used a quantitative approach with a quasi-experimental design. The sampling technique was conducted using random sampling. The results show that there is a significant difference in students' learning outcomes between the experimental classes and the control class. The Sig. (2-tailed) value of $0.000 < 0.05$ indicates that the use of STAD and PBL results in higher learning outcomes compared to the class that used conventional teaching methods.

Keywords: Cooperative Learning Student Teams Achievement Division (STAD), Problem-Based Learning (PBL), Learning Outcomes, History Learning

INTRODUCTION

Positions students at the center of the learning the main role of history education is to pass on the life and experiences of the

nation so they can be continued and developed in the present and the future (Alit, 2020). Without realizing it, it is very important to understand how secondary school students develop their understanding through learning history and philosophy (Purnomo & Kurniawan, 2025). However, history learning in schools is still often dominated by the lecture method, where the teacher explains the material while students mostly listen. This one-way learning process makes students less active in class (Tafonao et al., 2025). The lecture method has also become a common practice among history teachers (Kurniawan, 2020). As a result, many students have low interest and understanding of history lessons, especially in the topic of historical research, which requires analytical thinking, logical reasoning, and teamwork. In addition, students often think that history is only about memorizing facts and is not useful in real life. Because of this perception, students' learning outcomes in history are often not optimal. Different views on history come from each student's social, cultural, and educational background, and are also shaped by their environment and the media (Purnomo & Kurniawan, 2025). To solve this problem, teachers need to use learning models that can increase students' active participation in the classroom (Simanjuntak et al., 2023). Two learning models that are suitable for history learning are Student Teams Achievement Division

(STAD) and Problem Based Learning (PBL). STAD is a type of cooperative learning that asks students to work together in small groups to understand the learning material (Andrian et al., 2020). In this model, each student is responsible for helping their group achieve good results. Namara (2025) explains that STAD is also suitable for 21st-century learning because it helps students develop higher order thinking skills. Another model that can increase student activity is PBL. In PBL, students learn by solving real problems. This approach encourages curiosity and active participation in the learning process. According to Kusnandar (2025), PBL not only improves students' understanding of the material but also develops their problem-solving and collaboration skills. In SMA Teuku Umar Semarang, both STAD and PBL were implemented using group learning. However, the two models have different learning steps. In the STAD model, students study in groups and each student's individual score contributes to the group score. Therefore, every member must understand the material well. In contrast, the PBL model focuses on group discussions to solve real problems. After discussing the problem in their groups, students present their ideas in front of the class and continue the discussion with other groups. The results of this study at SMA Teuku Umar Semarang show that the use of STAD and PBL improves students' learning outcomes in the topic of Historical Research for Grade X compared to conventional learning. The class that used the STAD model showed an improvement of 38.41%. The class that used the PBL model showed a higher improvement of 48.26%. Meanwhile, the class that did not use these models only showed an improvement of 35.04%. These results show that the PBL model provides the highest increase in students' learning outcomes.

LITERATUR REVIEW

A. Lev Vygotsky's Constructivist Theory

Constructivism theory focuses on the cognitive development of individuals, which is influenced by social and cultural interactions (Pranyata, 2023). One of the central concepts in Vygotsky's constructivist theory is the Zone of Proximal Development (ZPD). ZPD refers to the distance between the learner's actual level of development, determined by the ability to solve tasks independently, and the potential level of development that can be achieved with assistance from a more knowledgeable person. This concept highlights the important role of guidance in helping students reach a higher level of understanding. In addition, Vygotsky introduced the concept of scaffolding, which refers to temporary support provided by teachers or peers to help students complete tasks (Vygotsky, 1978). Vygotsky's constructivist theory has strong relevance to studies that examine the implementation of the Cooperative Learning STAD and Problem Based Learning (PBL) models. Vygotsky emphasized that knowledge is not acquired passively, but is constructed through social interaction between individuals and their environment. This perspective aligns with the main principles of both learning models used in this study. A study conducted by Wahyuni and Prasetyo (2024) also found that the application of a social constructivist approach in differentiated learning can improve students' learning outcomes.

B. Student Teams Achievement Division (STAD)

Mahmudi (2022) explains that Student Teams Achievement Division (STAD) is one of the cooperative learning models that has been widely known and extensively studied. This model was developed by Robert E. Slavin and his colleagues at Johns Hopkins University. STAD has simple and flexible characteristics, which allow it to be applied at various grade levels, from second to twelfth grade, and across different subjects such as mathematics, language, social studies, and science. In this model, students are divided into small groups

consisting of four to five members. The groups are arranged heterogeneously based on students' abilities, backgrounds, and gender in order to represent the diversity of the classroom. The STAD learning model consists of five main components: class presentation, teamwork, quizzes, individual improvement scores, and team recognition. According to Robert E. Slavin (2015), the implementation of the STAD cooperative learning model has several strengths and limitations that have been widely discussed in educational research. One of its main advantages is its ability to increase students' active participation and build their self-confidence through social interaction within groups. This model also creates a more supportive learning environment, as students are encouraged to help and cooperate with each other in order to achieve group goals, which can improve their understanding of the learning material. However, the implementation of STAD also has some limitations. The learning process usually requires more time compared to conventional teaching methods because it involves group discussions and both individual and group assessments. Overall, although STAD provides many benefits in cooperative learning, teachers need to carefully design and manage the learning process so that its advantages can be maximized and its limitations minimized in classroom practice.

C. Problem Based Learning (PBL)

Problem Based Learning (PBL) is a student-centered learning model in which the learning process begins with a real problem that is relevant to students' daily lives (Darwati & Purana, 2021). Habibah (2024) explains that PBL is designed to bridge the gap between theory and practice through authentic problem solving, allowing students to connect academic knowledge with real-world applications. In the context of controversial topics, Purnomo (2016) states that such materials often generate differing opinions and perspectives, creating opportunities for discussion and debate. PBL provides a learning environment where

students can express their viewpoints and analyze problems from various perspectives. Aprina (2024) states that the PBL cycle generally consists of five stages: problem formulation, identification of learning needs, information searching, discussion of possible solutions, and reflection. These stages make PBL a learning model that emphasizes higher order thinking skills rather than merely focusing on factual knowledge. As a result, PBL creates an active, collaborative, and reflective learning atmosphere. PBL has several advantages that make it relevant in educational practice. Kususih (2024) explains that PBL can improve students' critical thinking, collaboration, and communication skills because the learning process is centered on discussion and problem solving. Muhartini (2023) adds that PBL makes learning more meaningful because students are confronted with contextual problems related to their everyday experiences, allowing them to apply theoretical knowledge in practical situations. Furthermore, Asrofi (2025) emphasizes that PBL encourages student independence, as each individual is required to search for information and contribute ideas within the group, fostering shared responsibility for learning outcomes. However, PBL also has several limitations. Some scholars argue that PBL requires more instructional time than traditional teaching methods because students must go through several stages of investigation and discussion before reaching conclusions. In this regard, the teacher's role becomes crucial, as successful implementation of PBL requires teachers to facilitate discussions effectively without dominating the learning process.

D. Learning Outcomes

Learning outcomes refer to the achievements obtained by individuals through the learning process, including cognitive, affective, and psychomotor aspects (Biantoro, 2022). Learning outcomes can also be defined as the results of learning activities that show changes in knowledge, skills, attitudes, and values as a

result of learning experiences, both formal and informal (Rahman, 2022). In general, learning outcomes reflect changes in students' behavior after participating in teaching and learning activities (Iskandar, 2021). The success of the learning process can be seen from the changes that occur in students after learning. According to Siregar (2024), students' learning outcomes are influenced by three main factors: internal factors, external factors, and learning approaches. Internal factors include physical conditions, such as health, as well as psychological aspects such as motivation, interest, attention, talent, and self-confidence. External factors involve the learning environment, including family, school, and society. In addition, learning approaches also affect learning outcomes. Paramita (2021) states that the learning strategies used by students, such as active learning, collaborative learning, or project-based learning, play an important role in helping students understand the material. To determine learning outcomes, evaluation is needed. Evaluation is used to measure how far learning objectives have been achieved and to provide a basis for improving the learning process. Evaluation is not only a tool for assessment but also serves as feedback for teachers and students to improve the quality of learning.

MATERIALS & METHODS

This study employs a quantitative research approach. Quantitative research is intended to examine relationships or effects between variables through systematic and controlled statistical procedures (Purnomo, 2010). Sugiyono (2023:17) explains that quantitative research is grounded in the philosophy of positivism, which views phenomena as classifiable, relatively stable, concrete, measurable, and characterized by cause-and-effect relationships. The study adopts a quasi-experimental design, which focuses on identifying causal relationships resulting from specific treatments so that their effects can be tested empirically. The first experimental group, Class X-2, was

taught using the Student Teams Achievement Division (STAD) learning model. The second experimental group, Class X-4, received instruction through the Problem-Based Learning (PBL) model. Meanwhile, the control group, Class X-5, was taught using the conventional lecture method without applying either STAD or PBL. The population of this study consisted of all tenth-grade students, totaling 157 learners. The research sample included Classes X-2, X-4, and X-5, with a total of 90 students selected using purposive sampling. Data were collected through pretests and posttests, as well as documents and documentation. The research instrument was a multiple-choice test. This study involved three variables: the first independent variable was the STAD learning model, the second independent variable was the PBL learning model, and the dependent variable was students' learning outcomes in history subjects. Data analysis was conducted using SPSS version 26.

RESULT AND DISCUSSION

This study was conducted at Teuku Umar High School, located in Gajahmungkur District, Semarang City, from September 29 to November 5, 2025. A preliminary observation carried out in early September revealed several learning problems, including students frequently falling asleep during lessons and paying little attention to the teacher. The learning process was still dominated by a teacher-centered approach, with lectures as the primary method. Students were required to listen to explanations from the beginning until the end of the lesson, resulting in a monotonous classroom atmosphere. Based on these conditions, the implementation of more innovative learning models was considered necessary to create a more engaging learning environment. Therefore, the Student Teams Achievement Division (STAD) and Problem-Based Learning (PBL) models were applied in this study. The study was conducted through four

instructional meetings in each class after the pretest. The pretest was administered from 29 September to 1 October 2025 in both the experimental and control classes. The first experimental class (Class X-2) applied the Student Teams Achievement Division (STAD) learning model. The learning sessions were conducted every Wednesday for four meetings. The first meeting was held on 8 October 2025 and discussed Historical Sources and the Steps of Historical Research. At the beginning of the lesson, the teacher introduced the material and formed student learning groups. The second meeting was conducted on 15 October 2025 and focused on Historical Writing (Historiography). During this meeting, students searched for information related to the topic collaboratively with their group members. The third meeting took place on 22 October 2025. In this session, students learned about Early Humans while working in their groups. At the end of the lesson, the researcher gave several questions, and groups that answered correctly received additional points. The fourth meeting was held on 29 October 2025 and became the final session of the Historical Research chapter. During this meeting, the entire class time was used for group evaluation. Students competed with other groups by answering questions to obtain the highest score. Individual scores contributed to the total group score, and the group with the highest score received an award at the end of the lesson. The second experimental class (Class X-4) applied the Problem Based Learning (PBL) model. The learning sessions were conducted every Monday for four meetings. The first meeting was held on 6 October 2025 and introduced the topics of Historical Sources and the Steps of Historical Research,

followed by the formation of learning groups. The second meeting was conducted on 13 October 2025. During this session, students began group discussions, and each group representative drew a discussion theme from a lottery. The third meeting took place on 20 October 2025 and involved class discussions based on the material studied in the previous meeting. Groups that volunteered to present their discussion results received additional points, as did students who actively asked questions or gave responses. The fourth meeting was held on 27 October 2025 and focused on clarifying concepts that were still not well understood by students. At the end of the lesson, awards were given to the best group and the most active students as a form of appreciation. The control class (Class X-5) used the lecture method and also consisted of four meetings. The first meeting was held on 7 October 2025 and introduced the same initial material as the experimental classes using a lecture approach. The second meeting continued the material and included several questions to encourage student participation. In the third meeting, students were given practice questions before the lesson began. The fourth meeting provided a review of the material that had been discussed in previous meetings. Students who actively asked or answered questions received additional points. After the four meetings in each class, the study ended with a posttest. The posttest was administered from 3 to 5 November 2025. Students answered 20 multiple-choice questions using their mobile phones under supervision to reduce the possibility of cheating. After the test was completed, the scores were recorded and collected as research data. The posttest results of the students are presented in the following section.

Table 1 Category Score

Classes	Category	Complete	Do not Complete	Average	Number of Student	Percentage (%)
Experiment 1 (STAD)	Pretest	5	25	57,8	30	16,6%
Experiment 2 (PBL)		1	29	51,6	30	3,33%

Control		5	25	58,5	30	16,6%
Experiment 1 (STAD)	Posttest	23	7	80	30	76,6%
Experiment 2 (PBL)		28	2	87	30	93,3%
Control		19	11	73	30	63,3%

Source: (2025 Research Data, processed)

Based on the pretest and posttest scores, it was found that all three classes in this study showed an improvement in their learning outcomes. The posttest results in the experimental classes indicate a fairly effective learning process. In Experimental Class 1, which implemented the STAD model, 23 out of 30 students achieved an average score of 80, meaning 76.6% of the students scored above 75. Before the treatment, the pretest average was only 16.6%, with just 5 students out of 30 passing. This indicates a significant increase in learning outcomes following the implementation of the STAD model. In Experimental Class 2, which applied the Problem Based Learning (PBL) model, 28 out of 30 students achieved an average score of 87, meaning 93.3% of students scored above 75. Prior to the treatment, the pretest average was only 3.33%, with just 1 student passing. These results clearly demonstrate a substantial improvement in student learning after the PBL intervention. These findings are in line with Vygotsky's social constructivist theory, which emphasizes that knowledge is built through social interaction, particularly through scaffolding and the Zone of Proximal Development (ZPD), where learners can reach higher levels of understanding with the assistance of peers. Ernawati (2021) highlighted that active student participation in enjoyable discussions can positively affect learning outcomes, as students focus on understanding the material and collaboratively support one another to achieve group success. Apart from the STAD model, this study also compared another instructional approach, PBL. The results at SMA Teuku Umar show that implementing PBL significantly enhances student learning outcomes. Nugroho (2023)

argued that PBL not only increases students' motivation to learn but also strengthens conceptual understanding through group discussions based on contextual problems. This demonstrates that PBL contributes not only to cognitive development but also fosters critical thinking toward the learning material. Previous studies, such as Faidin (2024), also support these findings, showing that PBL can improve problem-solving skills in history learning. Although the control class, which used the conventional lecture method, also showed improvement, the increase was the smallest among the three groups. This indicates that while lectures remain relevant, more innovative instructional models such as STAD and PBL yield substantially higher learning outcomes. The results of the ANOVA and Post Hoc tests showed a significance value (2-tailed) of 0.000, which is less than 0.05, indicating that the alternative hypothesis (H_a) is accepted, and the null hypothesis (H_0) is rejected. Therefore, it can be concluded that there is a significant difference in learning outcomes between the experimental classes and the control class.

CONCLUSION

The study results show that the greatest improvement in learning outcomes was observed in Class X-4, specifically in Experimental Class 2, which applied the Problem-Based Learning (PBL) model. The ANOVA test revealed a significant result (2-tailed) of 0.000, which is below the 0.05 threshold, indicating a meaningful difference between the experimental and control classes. A Post Hoc test was then conducted to examine whether the differences between the classes were statistically significant. The results showed a significance (2-tailed) of less than 0.05,

supporting the acceptance of the alternative hypothesis (H_a) and the rejection of the null hypothesis (H_0). This finding suggests that the implementation of the Cooperative Learning Student Teams Achievement Division (STAD) and Problem-Based Learning (PBL) models positively influenced the history learning outcomes of Class X students at Teuku Umar High School, Semarang.

Declaration by Authors

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