

Implementation of the Problem Based Learning (PBL) Model to Improve Self-Discipline in Students

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Abstract

This classroom action research (CAR) aims to improve student self-discipline through the application of the Problem-Based Learning (PBL) model. The study was conducted in grades eleven of a high school with 35 students as subjects. The research method used two cycles from Kemmis and McTaggart, consisting of planning, action, observation, and reflection, which were implemented in two cycles. The data collection instruments used were questionnaires and observations. The questionnaires were completed by the students, while the observation sheets were completed by the teacher as observer. The self-discipline indicators measured included: (1) punctuality (arriving on time and completing assignments according to schedule), (2) compliance with school rules, and (3) responsibility for tasks and roles in the classroom. The results showed an increase in the average score from 76.2% to 79.0%. The percentage of students with high self-discipline increased from 28.6% to 45.7%, while students with low self-discipline decreased from 22.9% to 8.6%. Thus, it can be concluded that the PBL model is effective in improving students' self-discipline through an active, contextual, and student-centered learning approach.

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1. Introduction

The learning process is a complex activity that brings about changes in an individual, including knowledge, attitudes, and skills. One important factor in supporting successful learning is self-discipline. Self-discipline reflects a student's ability to control habits, manage time, complete assignments on time, and accept responsibility for their obligations, even when these are not in line with their personal desires (McElmeel, 2002; Taylor et al., 2002; Knapczyk, 2004).

Self-discipline is closely related to self-regulated learning, which refers to students' ability to plan, monitor, and evaluate their own learning processes independently (Zimmerman, 2002). Previous studies indicate that self-discipline is a stronger predictor of academic success than cognitive ability, emphasizing its importance in long-term learning achievement (Duckworth & Seligman, 2005). Problem-Based Learning (PBL) facilitates meaningful learning by engaging students in complex problem-solving activities that promote responsibility, reflection, and independent learning (Hmelo-Silver, 2004). PBL is also defined as a student-centered instructional approach through which learners acquire knowledge and skills via structured investigation of authentic problems, fostering autonomy and discipline (Savery, 2006).

The problem is, the reality on the ground shows that many students still have low self-discipline, such as late submission of assignments, frequent unexcused absences, and inconsistent participation in learning activities. The theoretical basis for implementing learning that is believed to improve self-discipline is Problem-Based Learning (PBL). PBL is a contextual approach that encourages students to actively solve real-world problems, think critically, and take responsibility for their learning process and outcomes (Arends, 2012; Delisle, 1997). Previous research has shown that the implementation of PBL can increase student engagement, responsibility, and independence in learning, which are important indicators of self-discipline (Fogarty, 1997; Uden & Beaumont, 2006).

This research is significant in providing practical contributions for guidance and counseling teachers and subject teachers in designing learning processes that are oriented not only toward academic achievement but also toward strengthening positive character traits, particularly self-discipline. The justification for publishing this research lies in the need to find a learning model that is proven effective and relevant to the current learning

context, particularly within the Merdeka Curriculum framework, which emphasizes active learning and strengthening the Pancasila student profile.

Based on this background, the research question is whether the implementation of the Problem-Based Learning (PBL) model can improve student self-discipline. Therefore, the purpose of this study is to determine the improvement in self-discipline of grade eleven students through the implementation of the Problem-Based Learning (PBL) model.

2. Method

This research is a Classroom Action Research (CAR) model based on the Kemmis and McTaggart model (Carr & Kemmis, 1986). This model consists of two cycles, each encompassing four stages: planning, action implementation, observation, and reflection. Each cycle is conducted in two meetings, allowing for a systematic and sustainable learning improvement process. Through active engagement in problem analysis and solution development, the PBL model supports the development of responsibility and disciplined learning behavior among students (Hung, Jonassen, & Liu, 2008).

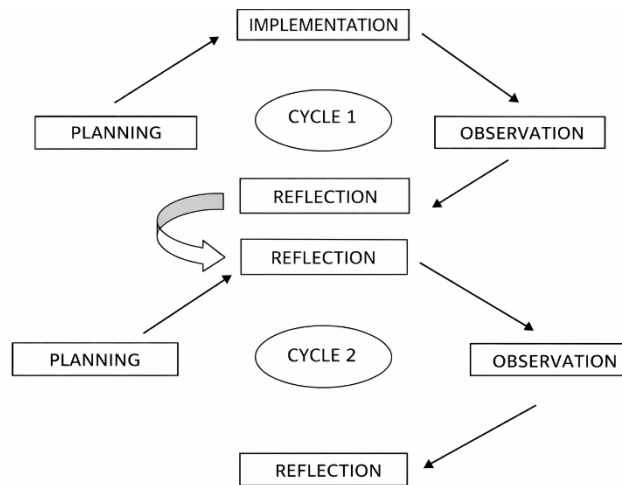


Figure 1. Classroom Action Research Cycle

The subjects of this study were 35, eleven-grade students of one of the senior high school in Surabaya, Indonesia. The study took place at a school in the city center, with a representative social and learning environment.

The instruments used in this study consisted of two types: the Student Self-Discipline Questionnaire, developed based on eight discipline indicators according to McElmeel (2002) and Taylor et al. (2002). This questionnaire consisted of 20 statements using a 5-point Likert scale. This instrument underwent readability testing with students and teachers to ensure content validity and ease of understanding. The PBL Learning Activity Observation Sheet, used to observe the implementation of the five stages of the Problem-Based Learning (PBL) model according to Arends (2012). This observation sheet had two answer choices (yes/no) and was completed by the researcher and the collaborating teacher.

Data Collection Techniques: Data were collected through two techniques: observation, to monitor student activity and engagement during the PBL-based learning process, and questionnaires, to measure students' levels of self-discipline based on established indicators.

Data Analysis Techniques: The data obtained were analyzed using a quantitative descriptive approach, as explained by Agung (2014), which is a technique for processing data in numerical or percentage form to draw general conclusions. The analysis was conducted by: calculating the average and percentage of discipline scores for each cycle, comparing results between cycles to determine the effectiveness of the PBL model implementation, and determining the effectiveness of improvements based on success criteria, namely a minimum of 75% of students in the moderate to high category. An increase of $\geq 5\%$ between cycles is considered a practically meaningful change in the context of CAR.

The results of this analysis were used to evaluate the extent to which the implementation of the Problem-Based Learning (PBL) model improved student self-discipline in the classroom. To determine the percentage of the discipline survey results, the following formula was used:

$$P = \frac{\sum \text{score}}{\sum \text{total score}} \times 100\% \tag{1}$$

Description:
P = Success Rate

The research results are also categorized as follows:

- a. Improvement in Self-Discipline (Test Score): There was an increase in the average score from pretest to posttest in both cycles.
- b. Effectiveness of the Approach Used: Cycle I: The Problem-Based Learning (PBL) approach showed an increase in self-discipline in students. Cycle II: The Problem-Based Learning (PBL) approach showed a decrease in undisciplined behavior in students.
- c. Development of Self-Discipline: Significant improvement was seen in setting time for practice and making plans to achieve these goals. Commitment to tasks increased consistently in each cycle.

3. Results and Discussion

This study involved 35, eleven grade students. The study took place at a school in the city center, with a representative social and learning environment. Active learning strategies such as PBL have been empirically shown to improve student engagement, responsibility, and learning persistence, which are core components of self-discipline (Prince, 2004). Motivation and self-discipline are interrelated constructs, where students with strong self-regulation skills demonstrate higher persistence, task commitment, and responsibility in learning activities (Schunk & Zimmerman, 2012). Learning models emphasizing real-world problem-solving encourage students to manage time effectively, collaborate responsibly, and demonstrate disciplined learning behavior (Thomas, 2000).

The results of a descriptive analysis of student self-discipline data showed a significant increase between cycles I and II. This increase was evident in the average (mean) self-discipline, which rose from 76.25% in cycle I to 79.05% in cycle II. Furthermore, the median and range values also indicated an increase in student self-discipline after the implementation of the Problem-Based Learning (PBL) model. The following are the results:

Table 1. Results of Descriptive Analysis of Data on Self in Cycle I and Cycle II

Statistic	Cycle I	Cycle II
Mean	76.25714	79.05714
Standard Error	2.104554	1.747961
Median	78	80
Mode	81	90
Standard Deviation	12.45071	10.34107
Sample Variance	155.0202	106.9378
Range	48	46
Minimum	50	52
Maximum	98	98
Count	35	35

The results showed an increase in the average self-discipline score from 76.2% in cycle I to 79.0% in cycle II. The percentage of students in the high category increased from 28.6% to 45.7%. Meanwhile, the percentage of students in the low category decreased from 22.9% to 8.6%.

Table 2. Results of the Student Self-Discipline Questionnaire

Cycle	Category	Score Range	Number of Students	Percentage
I	Low	50-65	8	22.9%
	Medium	66-81	17	48.6%
	High	82-98	10	28.6%
II	Low	52-66	3	8.6%
	Medium	67-81	16	45.7%
	High	82-98	16	45.7%

This improvement reflects the success of PBL implementation in fostering self-discipline. Students became more active, responsible, and motivated to complete assignments. This finding aligns with the findings of Fogarty (1997) and Arends (2012) that PBL can enhance responsibility and independence in learning. A

limitation of this study was the limited number of subjects; therefore, further research with a larger and more diverse student population is recommended.

The results showed an increase in student self-discipline after the implementation of the Problem-Based Learning (PBL) model. Data from the student self-discipline questionnaire showed an increase in the percentage of students in the high self-discipline category from 28.6% in cycle 1 to 45.7% in cycle 2. Conversely, the low self-discipline category decreased from 22.9% in cycle 1 to 8.6% in cycle 2.

Research data shows that the average student Self-Discipline score increased from 76.25% in cycle I to 79.05% in cycle II. This increase was supported by systematic PBL learning steps, such as problem-orientation, student organization, investigative guidance, product development, and analysis and evaluation of problem-solving. These stages reflect the teacher's role as a facilitator who helps students connect new knowledge to real-world contexts, as outlined by Rusman (2010) and the Ministry of Education and Culture (2013).

This indicates that most students experienced improved learning outcomes, which can be attributed to increased self-discipline and the effectiveness of the learning approach used, namely Problem-Based Learning (PBL).

Self-discipline, according to experts such as McElmeel (2002), Taylor et al. (2002), and others, encompasses an individual's ability to control habits, be responsible, persevere, and work hard over the long term, despite facing difficulties or discomfort. In this context, the increase in the number of students in the high category indicates that students are beginning to demonstrate strong determination and perseverance in achieving their learning goals, and they are able to self-regulate to complete tasks even when they may not feel like it. The self-discipline experienced by students consistently influences improved learning achievement.

The Role of Problem-Based Learning (PBL) Problem-based learning (PBL) encourages students to confront real-life problems relevant to their lives, to think critically and find solutions independently or in groups, to organize their own learning and take responsibility for the results. In this process, indicators of self-discipline such as hard work, responsibility, and the ability to overcome difficulties are emphasized. When students investigate and solve problems, they are required to be independent, persistent, and responsible with time and assignments. Discipline emerges as an active and contextual learning process

4. Conclusion

Problem Based Learning (PBL) learning model The application of this model encourages students to think critically, responsibly, and actively in the learning process. Based on the results of the study, it can be concluded that the application of the Problem Based Learning (PBL) learning model significantly improves self-discipline of students in grade XI-3 of SMA Negeri 6 Surabaya. This is indicated by an increase in the average discipline score from 76.25% in cycle I to 79.05% in cycle II, as well as an increase in the percentage of students in the high discipline category from 28.6% to 45.7%, and a decrease in the low category from 22.9% to 8.6%. This increase reflects the success of PBL in forming a responsible attitude, hard work, and self-regulation skills in students through an active, contextual learning process, and centered on solving real problems.

Author Contributions

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The author declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

Data Availability

The datasets generated during and/ or analysed during the current study are available from the corresponding author on reasonable request.

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