
Application of Problem Based Learning Assisted by Reward and Punishment to Improve Self-Regulation of Junior High School Students

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Abstract. The purpose of this research is to solve learning problems in class, especially student learning independence. Based on the results of student observations in the learning activities that have been carried out, it is known that the independence of student learning is still quite good. In fact, independent learning is one of the success of learning. Based on observations in class, it is known that the independence of student learning is still low. This is indicated by indicators that students are less actively involved in learning in class and are still unable to independently learn to present the results of their discussions in front of the class. This problem occurs because the learning process in the classroom directs students more to work on their student worksheets without carrying out discussion activities that involve student activity in learning. Efforts made to increase learning independence are the problem based learning (PBL) and reward and punishment models. The research method used is the classroom action research (CAR) cycle. The object of research is class VII junior high school students. Collecting research data using observation sheets and student reflection questionnaires. Quantitative descriptive data analysis techniques with very good, good, good enough criteria. Based on the results of the study, it was found that there was an increase in the learning independence of students using the PBL and reward and punishment learning models. This increase occurred after the implementation of learning for 2 cycles.

Keywords: Problem Based Learning, Reward and Punishment, Self Regulated Learning

Introduction

Education is very important in any country. The quality of a country's education shows the progress of thinking and determines the progress of the nation. The existence of quality education will help a country create the next generation who are experts in various fields. The low quality of education in a country will result in the nation or country being left behind. Therefore, education is a key in building and improving a country (Kurniawati, 2022).

Indonesia is a country that really cares about its education. This is shown by the existence of a curriculum that continues to develop following technological advances and current developments in the 21st century. However, education cannot be separated from problems that cause low quality of education. The low quality of education can occur due

to the lack of independent learning for students to be enthusiastic and interested in learning. Improving the quality of education can occur because students want to be actively involved in the learning process (Isnawati & Samian, 2015).

Educational success can be seen from the presence or absence of student self regulated learning (Ningsih & Nurrahmah, 2016; Somawati, 2022). Self regulated learning is very important and must be a concern for the parties involved in the world of education. The existence of self regulated in learning will make students able to direct their feelings without any influence from other people and take the initiative in solving the problems they face (Ningsih & Nurrahmah, 2016).

Self regulated learning is an attitude of freedom in action, responsibility which is marked by a desire to learn and gain new experiences (Mashuri, 2016). The characteristics of independent learning are being able to think critically, creatively and innovatively, not being easily influenced by the opinions of others, not running or avoiding problems, solving problems by thinking deeply, not feeling inferior when you have to be different from others, trying to work full of perseverance and discipline, and is responsible for his own actions (Asmar, 2018; Prayuda et al., 2014). Self regulated learning can be carried out by someone if that person has self-confidence (Pratiwi & Laksmiwati, 2016).

In the description above, the researcher is interested in raising the problem of student self regulated learning in class VII junior high school students. The results of observation activities carried out in class show that students are not actively involved in learning in class and are still unable to independently learn to present the results of their discussions in front of the class. This is because the learning that is carried out directs students to work on their student worksheets only without carrying out discussion activities that involve student activity in learning.

Based on the results of student observations in the learning activities that have been carried out, it is known that 69.4% of students are confident in learning, 68.1% of students are confident in making presentations in front of the class, 60.4% of students carry out asking activities in groups or with groups others, and 62.5% of students who were active in raising their hands in the learning process in class. The results of this observation are in the sufficient category, indicating that student self regulated learning is still low in the learning process in the classroom. Therefore efforts are made to increase student self regulated learning by using problem-based learning models with reward and punishment methods.

Self regulated learning (SRL) is a key competency that lays the foundation for lifelong learning (Dent & Koenka, 2016). SRL is described as a dynamic process in which learners personally activate and maintain cognitions, feelings, and behaviors that are systematically oriented toward achieving learning goals (Theobald, 2021). SRL also means learning is regulated by students and not motivated by external factors and people (Gomaa, 2017). Students can manage their own learning, direct and direct cognitive and motivational activities to achieve learning goals. SRL is very important so that students are able to manage their own learning (Broadbent, 2017; Gambo & Shakir, 2021).

SRL fits into current educational initiatives and innovations (21st century learning, inquiry learning, inclusion, assessment for learning). SRL is associated with students being adaptive, critical lifelong learners and creative thinkers, problem solvers, and being able to

work and learn both independently and collaboratively (Perry et al., 2017). Teachers use several strategies to facilitate Self regulated learning. For example, teachers support students' metacognition when they: make learning fun and provide opportunities for students to gather knowledge about themselves as learners through self-assessment and reflection; provide visual clues; engaging students in group discussions and encouraging task interpretation through metacognitive questions (Brenner, 2022). One strategy that can be applied to encourage independent learning is the problem-based learning and giving reward and punishments.

There are several advantages of the problem based Learning learning (PBL) model according to Lismaya (2019) namely PBL is a pretty good model for understanding lesson content because students are directly confronted with problems that exist in the real world and make learning more meaningful. Meaningful learning will provide convenience and acceleration to students in understanding the concepts and principles of learning as a whole. PBL can improve student learning activities, support abilities communication, cooperation, communication, creativity especially critical thinking (Issa & Khataibeh, 2021). The level of student learning activity will be higher both physically, psychologically, and emotionally. Another advantage of the PBL model is that it makes education in schools more relevant to life outside of school because in the learning process students are trained to highlight problems from various aspects (Almulla, 2020; Masrinah et al., 2019).

Reward is a form of reward to students for their hard work in obtaining achievements through learning both in groups and individually. Reward treatment is a way that is considered successful in developing students' interest in learning or doing something. Punishment can be interpreted as a sanction given to students if they make mistakes or intentionally violate the rules that have been set. The purpose of punishment is to raise awareness that arises from within students about the mistakes they have made (Putra et al., 2018). Reward and punishment are essentially used for educational purposes. They are deliberately chosen by teachers to make learning process effective. It further aims to improve students' learning achievement (Sidin, 2021).

The application of giving rewards should be balanced with punishment. This aims to form the self regulated learning of students, not only rewards are given to increase the willingness to learn or just giving punishment to bring up discipline (Sidin, 2021). Both need to be raised side by side so that there are steps in it that will spur students to make their own choices whether they want to get a reward or instead allow themselves to receive punishment (Lestari, 2019). Being able to make their own choices is an indicator of self regulated in learning so that the application of reward and punishment as motivation to form student learning independence (Alinurdin & Suwahyu, 2019).

PBL was chosen because it involves students in solving problems relevant to the material and developing student self regulated learning in finding information from relevant sources (Susilowati, 2018). This learning model also helps students' active participation in class in groups. Then the reward and punishment method is used to motivate and encourage students to study hard and be able to be independent and actively participate in learning activities in class. Based on the explanation of the solutions presented, the aim of this study is to increase student regulated learning by applying the PBL model assisted by giving rewards and punishments to students.

Methods

The research method used in this research is the class action research method CAR according to Kurt Lewin. This model is the main reference for other CAR models. Kurt Lewin was the first to introduce action research. Kurt Lewin's CAR concept consists of four components, namely planning, acting, observing, and reflecting. At the planning stage, learning plans are prepared, preparation of learning support tools and learning evaluation. Then action is taken from the results of the learning design and observation of the implementation of learning. At the end of the CAR stage, reflection on learning was carried out to improve the learning process carried out. The cycle will be repeated if the expected increase has not occurred.

The object of this research is students of class VII junior high school even semester 2022/2023 academic year. The research object was only taken by one class to observe the increase in self regulated in learning using the PBL and reward and punishment learning model. Indicators of student self regulated learning consist of self-confidence, responsibility, initiative, and discipline.

The data collection technique used is the non-test technique. This non-test data collection is used to assess the increase in student self regulated learning during learning through student observation and student reflection questionnaires. The data analysis technique used is quantitative descriptive. Data analysis is used to describe data that shows conditions in the learning process in class and student activities. The data obtained were analyzed using the formula:

$$P = \left(\frac{S}{N} \right) \times 100\% \quad (1)$$

Formula description:

P : percentage mastery of each aspect
S : acquisition score of each aspect
N : total score

After obtaining the final percentage, students are grouped into several categories as follows:

Table 1. Score Category

Interval (%)	Category
80 – 100	Very good
70 – 79	Good
60 – 69	Pretty good
< 60	Very Not good

(Source: Sugiyono, 2018)

Results and Discussion

Class action research activities carried out in 2 cycles. This is because there is an increase in student self regulated learning so there is no need to carry out the next cycle. In cycle 1, learning planning was carried out on biodiversity material regarding interactions between biotic and abiotic components. Learning is done by dividing students into several groups according to the level of ability of students. The teacher compiles observation sheets and reflections on the independence of student learning and compiles plans for implementing learning according to the characteristics of students. The learning media used are video and power point.

Based on the implementation of cycle 1 learning, the reflection results obtained that when presenting student worksheets it was considered quite difficult so they could not finish it on time. Student presentation activities in front of the class to improve self-regulated learning in the discussion process have not been carried out effectively. The teacher presents too many videos so that it takes up a lot of time. There are still students who are not involved in group activities, this shows that one indicator of self-regulation learning is still not good. The division of groups that are not in accordance with the level of student abilities so that the teacher has difficulty in determining student priorities that need to be increased in learning independence. The results of this reflection are followed up with the implementation of cycle 2 learning.

Planning in cycle 2 was carried out based on reflections on the learning activities in cycle 1. Prior to the implementation of the lesson, the teacher designed groups that were again adjusted to the characteristics of students based on their level of ability and learning style. The learning media used are infographics, power point. In the student worksheets, an explanation of the procedure for a good presentation is given so that the activity is more focused. During the presentation process students may ask two questions to the presenter and the presenter may ask questions about the material being explained to other groups. This aims to make the discussion run actively. During group activities each student must have responsibility in doing the assignments given.

During the implementation of cycle 2 the reflection results obtained that there was an increase self regulated learning that had gone well. The application of PBL models is able to help independent learning because students are actively involved in the process of implementing learning in class. Providing reward and punishment in the learning process helps increase learning motivation so that students want to actively ask questions or answer questions/quizzes posed by the teacher.

The division of study groups according to the level of ability of students helps in directing and teaching students, especially the low group, to be independent in doing their work. Learning activities may still have deficiencies or not optimal because there is 1 student who seems less involved in the discussion process in implementing learning in class and students who are not included make it difficult for them to do the assignments given so the teacher needs to pay attention to these students or needs to be analyzed further why these students are less motivated in discussion activities. The following is a comparison of the results of student self regulated learning in cycle 1 and cycle 2.

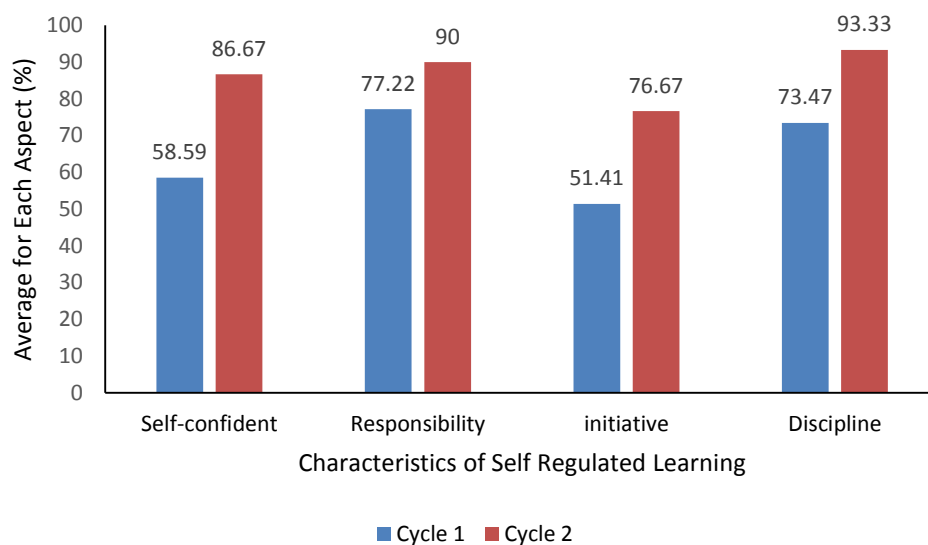


Figure 1. Self Regulated Learning Chart Based on Teacher Observation Sheets

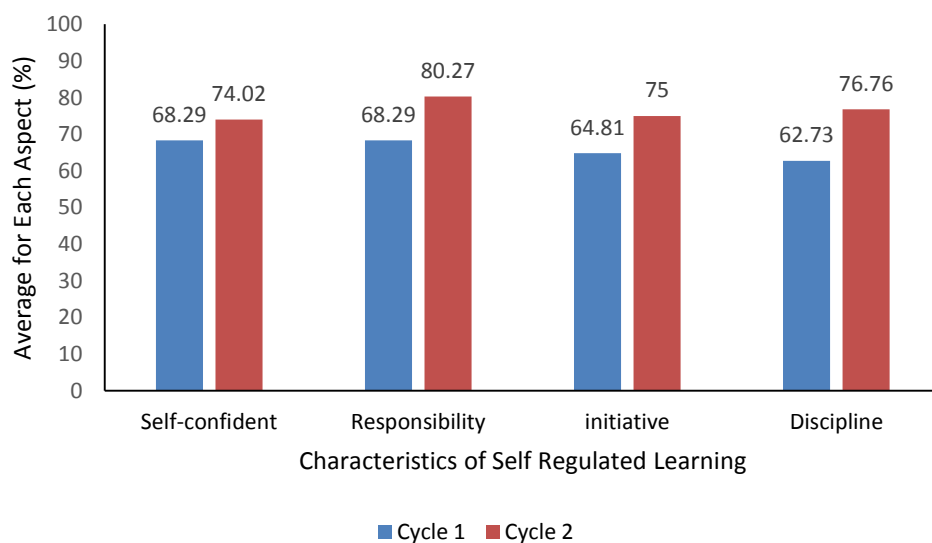


Figure 2. Graph of Student Regulated Learning Based on Student Reflection Questionnaire

Based on the results of cycle 1 it is known that student learning self-regulation still has an average of 65.17% in the pretty good category. The percentage of each indicator is self-confidence 58.59% category is not good, responsibility is 77.22% good category, initiative is 51.41%, category is not good, and discipline is 73.47% good category. The average reflection of students' self-regulated learning was obtained at 66.03% in a pretty good category too.

The results of the observation sheet and reflection questionnaire have different percentages because the observation sheet is through teacher observation while the reflection questionnaire is filled in directly by students based on the implementation of the learning carried out. The response to the results of student teacher observations was good on indicators of responsibility and discipline because they were above the CAR success criteria expected by researchers of 70%. But it still needs to be improved on the indicator of 58.59% trust and 51.41% initiative.

Student responses from the reflection questionnaire also indicated the need for improvement in all indicators of self-regulated learning because almost all of them were below 70% in a fairly good category. Based on the results of the self-regulated learning indicators, there are 2 items that fall into the unfavorable category in both the results obtained from teacher observation and student reflection. The low results of these 2 indicators occur because of the poor implementation of the PBL model steps. All PBL steps were not carried out properly, especially at the stage of presenting the results of students' assignments in front of the class. This is because there are too many student worksheets so there is no time for presentation activities. Initiative is the desire of students to be actively involved in learning which can be observed in discussions where students independently explore information to solve given problems (Kirmizi, 2013). Confidence is shown when students are able to express themselves in groups and explain their work in front of the class.

The development of self-confidence and initiative in learning is influenced by stimuli from the surrounding learning environment which involve reinforcement, rewards, or punishments that shape cognitive and affective outcomes and student grades (Basak & Ghosh, 2011). The student-centered nature of PBL as a learning tool that relies on students' active participation is able to increase their self-confidence and further increase their sense of self-control. The way PBL is carried out and facilitated influences the level of students' appreciation of the environment and further influences their active participation in learning (Abdalla et al., 2019). In addition, PBL model can improve critical thinking skills, foster student initiative, internal motivation to learn and can develop interpersonal relationships in group learning (Ramadhani et al., 2019).

On the indicator of responsibility obtained by 77.22 and 68.22% from teacher observation and student reflection. Indicators of responsibility are known by observing students' active participation in group work activities. The results obtained are good. But in learning there are still some students who do not participate in working on student worksheets so that there is a need for improvement. Improvements are implemented by directing each student to be responsible for doing their job. Responsibility in carrying out important tasks in the context of positive changes in understanding the material in the activities of completing assignments given by the teacher (Juriah, 2016). Increasing student responsibility shows that learning is carried out effectively in increasing self-regulated learning. When students have responsibility in learning, students will be able to understand the lesson more deeply (Cevat & Akkaş, 2019).

In the discipline indicator, the results obtained from teacher observation were 73.47% and student reflections amounted to 62.73% who obeyed the rules and carried out the learning process well. Based on this, it is also a weakness of researchers in

determining agreement at the beginning of the learning process in class. After improvements were made by applying the reward and punishment method, there was an increase in the disciplinary indicators by 93.33 and 76.76%. A significant difference from teacher observation and student reflection occurs because students consider themselves to have good behavior in discipline at school. Even though in the implementation of learning students already have very good disciplinary behavior which is shown from the results of teacher observations that students have been able to do assignments on time and comply with the rules of the initial class agreement.

Discipline can grow and fostered through training, education or instilling habits that must be started in the family environment, starting from childhood and continuing to grow so that discipline gets stronger through education at school. Discipline will encourage students to improve self-regulated learning. This is demonstrated by independent learning behavior such as doing well on assigned tasks, and exploring information related to learning (Susanto et al., 2020). The application of the reward and punishment method in improving discipline. This is because the reward and punishment learning method allows students to be disciplined in the learning process so that it is expected to motivate students to discipline themselves (Kurniawati, 2021). Both the positive and negative reinforcement can contribute to discipline in the school. In order for the school to increase discipline in the classroom, there is a need to influence behavior by adding something unpleasant, and influence behavior by taking away something unpleasant. Both methods are employed to influence behavior, but positive punishment looks to remove or decrease a "bad" behavior while negative reinforcement seeks to encourage or increase a "good" behavior (Agyekum, 2021).

In cycle 1, not all of the plans that have been prepared have been implemented properly. This is because the student worksheets that need to be completed by students are considered by students to be too many and quite difficult so that the process takes more time than planned. As a result, the learning planning phase of presenting the discussion results was not carried out effectively. There were still many students who were not involved in group discussion activities in completing student worksheets. Student worksheets is only done by one or two students. This is an indicator of the low self regulated of student learning.

The implementation of the PBL model is hampered when the teacher is not able to meet the needs of different students. Both understanding the level of ability of students or positioning the role as a facilitator, guiding, digging a deeper understanding. The process of supporting student initiative in learning is not an easy thing. This can be influenced by various factors of students' initial abilities, level and speed of thinking as well as other heterogeneous aspects, so that teachers need to continue to practice sensitivity so that they are able to meet the needs of students with different portions appropriately so that the inquiry process goes well (Tyas, 2017). Therefore, improvements in cycle 1 are knowing characteristics such as the ability level and learning styles of students and grouping students appropriately according to their needs.

During the quiz at the end of the learning activity, students are active and try to answer the questions posed by the teacher. This is due to the provision of rewards to students. Giving rewards and punishments makes students able to make their own choices

where this is an indicator of self regulated in learning responsibility so that the application of reward and punishment as motivation to form student self regulated learning (Alinurdin & Suwahyu, 2019). Students also know the impact of bad or inappropriate behavior that they do in the learning process. In cycle 1 activities, giving punishment is carried out if students are noisy and do not pay attention when the teacher or friends explain in front of the class. The application of reward and punishment shows success in efforts to increase student learning motivation.

Learning activities continued in cycle 2. The results of class action research in cycle 2 obtained a significant increase from the previous learning process. The results of the student self regulated learning observation sheet for each indicator obtained a percentage of self-confidence 86.67%, very good category, responsibility 90% very good category, initiative 76.67%, good category, and discipline 93.33% very good category. Based on the student self regulated learning reflection questionnaire, it was also obtained an average of 76.65% in the good category. Each indicator of the student learning reflection questionnaire increased with a percentage of self-confidence 74.02%, initiative 75%, discipline 76.75% in the good category and responsibility 80.27% in the very good category.

These results were obtained due to improvements from reflections in cycle 1. The learning process was going well. The application of the PBL model has been carried out with the design of student worksheets that students can work on in a timely manner in accordance with the lesson plans made. In cycle 2 activities so that all students are involved in the group discussion process the teacher makes an agreement at the beginning of the lesson and designs worksheets to make each group name and their responsibilities in doing the task. If students are not involved in group activities they will be given punishment.

In cycle 2 the division of groups has also been appropriately adjusted to the ability level of students and their learning styles so that researchers/teachers are able to pay attention in different portions according to the abilities of students appropriately. Much attention is given to a group with a low level of ability or students who were not previously involved in the process of doing group assignments. The researcher also observed that other groups had started to be actively involved in the discussion process. The drawbacks of the learning process in cycle 2 are that there is 1 student who seems less involved in the discussion process in the implementation of learning in class and students who do not enter make it difficult for them to do the assignments given so that the teacher needs to pay attention to these students or needs further analysis why these students are less motivated in discussion activities.

Based on the results of classroom action research that has been done, it is known that the application of the PBL model and the reward and punishment method is able to increase the self regulated learning of students. PBL is able to develop student self regulated learning because there is a process of solving problems that are relevant to the material so that students learn independently in finding information from relevant sources (Susilowati, 2018). The PBL model allows students to be actively involved in solving meaningful problems. In learning activities, students are given the opportunity to solve problems in groups so they can form independent learning habits (Supriyantoko et al., 2022). Based on previous research by Aulia et al., (2019) and Widiastuti et al., (2010) it

is known that the application of the PBL model is able to increase student self regulated learning.

The PBL model implemented together with the reward and punishment method helps in significantly increasing the self regulated learning of students. reward and punishment method. The application of giving rewards should be balanced with punishment. This aims to form the self regulated of students, not only rewards are given to increase the willingness to learn or only giving punishment to bring out a disciplined attitude (Kurniawati, 2021). Both need to be raised side by side so that they can spur students to make their own choices whether they want to get a reward or allow themselves to receive punishment. Being able to make their own choices is an indicator of self regulated in learning so that the application of reward and punishment as motivation to form student self regulated learning (Alinurdin & Suwahyu, 2019). In addition, giving rewards to students can also increase students' learning motivation so that they are expected to have full awareness of the importance of learning, enthusiasm, high willingness to learn so as to develop self regulated in learning.

Conclusion

Reward and punishment can increase self regulated learning of students significantly. This is known from the increase in self regulated learning from cycle 1 to cycle 2. The self regulated learning of students increases based on the process of improvement and reflection from cycle 1 to cycle 2. The impact of applying the PBL model and reward and punishment learning methods is to make students actively involved in the learning process in class, being able to make presentations in front of the class, student-centered learning, and dividing groups according to the characteristics of students makes the teacher able to give students attention according to their portion so that each student is able to increase their self regulated learning.

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