



Enhancing Student's Motivation through Snowball Throwing Model in Science Education

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ABSTRACT

This Classroom Action Research (CAR) aims to enhance students' learning motivation through the implementation of the Snowball Throwing learning model. The study was conducted at SMAN 1 Palu with 35 students of class XI MIPA 6 as the research subjects. The CAR was carried out in three phases: pre-action, Cycle I, and Cycle II. Data were collected through observation and a learning motivation questionnaire. The findings revealed that students' learning motivation in the pre-action phase was categorized as "fair" with a percentage of 54%. After the implementation of the Snowball Throwing model in Cycle I, students' motivation increased to 72% ("high" category), and in Cycle II it further improved to 87% ("very high" category). These results indicate that the Snowball Throwing model is effective in improving students' learning motivation, as it actively engages them in discussion and collaborative activities, making the learning process more interactive and enjoyable. The implication of this study is that teachers may employ the Snowball Throwing model as an alternative instructional strategy in Biology learning to foster students' learning motivation.

INTRODUCTION

Education is a process of developing an individual's identity with the primary goal of fostering an enlightened society and preparing future generations to face the challenges of a rapidly changing era. One of the key factors in improving the quality of education lies in the competence of educators in delivering knowledge as well as instilling essential values in students. Teachers, as professional educators, are required to adapt to contemporary developments and continuously enhance their teaching competencies, both in terms of instructional delivery and classroom management (Ratih & Lindawati, 2022). Within the educational context, learning activities constitute the core of the instructional process, contributing significantly to the improvement of students' skills and competencies.

Learning is a process undertaken by an individual to acquire knowledge, which consequently leads to changes in behavior toward a better direction (Ernata, 2017; Nugraha, 2018). In the school learning process, learning activities should enable students to easily understand concepts and grasp meaning. Therefore, the subject matter must be organized and presented in a structured and simplified manner (Azizah & Alberida, 2021). One of the subjects that strongly emphasizes conceptual understanding is Biology (Azizah & Alberida, 2021).

Biology is often perceived as a subject that is predominantly memorization-based (Suryanti et al., 2019). This tendency may hinder students' understanding of Biology, as learning Biology should not merely rely on memorizing material, but rather on comprehending the underlying concepts (Yusup, 2018). From the perspective of subject content, Biology does not only involve concepts derived from concrete scientific facts but also those related to abstract objects (Aisyiyah & Amrizal, 2020; Pratiwi et al., 2019; Rahmadani et al., 2017). These conceptual foundations serve as the basis for understanding the subject matter. However, the complexity of concepts and terminology often creates difficulties for students in learning Biology. Such difficulties may influence students' learning motivation. This is consistent with the findings of Batania et al. (2024), who reported that students encounter challenges in learning Biology due to abstract concepts and instructional structures that lack contextualization. These findings highlight the necessity of implementing innovative learning models to enhance both conceptual understanding and learning motivation.

Learning motivation refers to the condition in which students possess the drive to engage in learning activities. It represents a dynamic aspect of the learning process; therefore, teachers must make concrete efforts to sustain and enhance students' motivation. In many cases, unsatisfactory learning outcomes are not due to students' lack of ability, but rather to a decline in their learning motivation (Diandaru, 2023). Students will enjoy learning when they are encouraged by motivation, whether intrinsic or extrinsic. Intrinsic motivation arises from within the individual and is influenced by both physical and psychological conditions that shape the learning drive. Extrinsic motivation, on the other hand, originates from external factors, such as the family, school environment, community, culture, traditions, physical surroundings, household facilities, climate, and spiritual or religious environment (Purba et al., 2023). Students' motivation in the classroom can also be influenced by teachers' innovation in the learning process. Therefore, to enhance students' learning motivation, innovation in instructional models is required. An appropriate learning model will stimulate students' motivation to further explore the subject matter. According to Faniastusi (2019), students' motivation is largely influenced by teachers' instructional approaches and should be supported through the integration of various models, media, strategies, and methods to increase students' active involvement in learning.

In the field of education, there are various instructional models that teachers may select according to classroom situations and student characteristics. One widely applied model is Snowball Throwing, which aims to enhance students' learning motivation and increase their interest in the subject matter. This model is team-based and incorporates elements of play, thereby fostering collaboration and communication among students, which in turn is believed to increase their involvement in the classroom. As reported by Almagfira et al. (2024), cooperative learning and group activities provide more meaningful learning experiences that can significantly foster higher levels of learning motivation. The term Snowball Throwing is derived from two words: snowball and throwing. A snowball refers to a ball of snow, while throwing means to toss. Combined, Snowball Throwing refers to an instructional model that allows students to develop skills in formulating and answering questions through a playful approach (Timor, 2023). In practice, students are divided into groups. After the teacher delivers the

lesson, each group writes questions on sheets of paper, crumples them into balls resembling snowballs, and then throws them to other groups. The students who receive the “snowballs” open them and attempt to answer the questions (Mahendra & Kusuma, 2018). Through this model, students are actively engaged in the learning process while experiencing a fun and enjoyable classroom atmosphere. Furthermore, the Snowball Throwing model serves as a medium to cultivate students’ preparedness, comprehension, and confidence in expressing their thoughts, while simultaneously nurturing their potential for active learning (Mariyaningsih & Hidayanti, 2018).

Based on preliminary observations conducted in Grade XI MIPA 6 of SMAN 1 Palu, it was found that students’ learning motivation was relatively low, and their level of participation during the learning process was limited. This condition was largely attributed to the frequent use of the lecture method in Biology classes, which often led to student disengagement. Students also struggled to grasp key concepts when instruction was delivered solely through lectures. On the other hand, they showed greater enthusiasm and motivation when learning activities were interspersed with games. However, in such cases, students tended to focus more on the game itself rather than on the subject matter being taught. To address these challenges, it is necessary to implement an engaging instructional model that can foster students’ enthusiasm for learning. Therefore, the researcher was motivated to investigate the application of the Snowball Throwing learning model to enhance the learning motivation of Grade XI MIPA 6 students in Biology. The implementation of this model is expected not only to create a playful learning environment but also to develop students’ thinking skills, enabling them to better understand the concepts being taught.

The use of the Snowball Throwing instructional model can effectively capture students’ attention, as its implementation encourages active participation throughout the learning process, thereby fostering students’ motivation to learn. Students are more likely to develop interest in learning when instructional models with imaginative elements, such as Snowball Throwing, are applied. This model is considered imaginative because it involves the use of paper, shaped into balls, which are then thrown to other groups, thus preventing students from experiencing boredom during the learning process (Purba et al., 2023).

Based on the background and preliminary observations, the research problem in this study is whether the implementation of the Snowball Throwing learning model can improve the learning motivation of Grade XI MIPA 6 students at SMAN 1 Palu. This study contributes to the advancement of education by illustrating the relationship between the instructional model employed by teachers and the enhancement of students’ learning motivation. The primary objective is to provide insights for teachers in developing instructional models that are more engaging and relevant to students’ characteristics. Furthermore, the findings are expected to offer practical recommendations for improving students’ learning motivation in the context of Biology education.

METHOD

This study employed Classroom Action Research (CAR). Classroom Action Research is an effort to improve the teaching and learning process through systematically designed instructional plans. The model of CAR applied in this study refers to Kemmis and McTaggart’s framework, which consists of a cyclical process of planning, action, observation, and reflection. The model is illustrated in Figure 1.

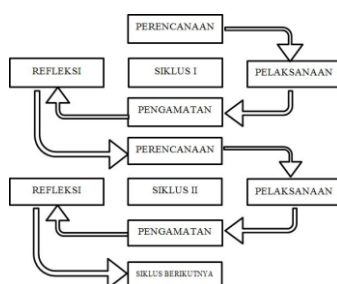


Fig 1. Kemmis and McTaggart’s Classroom Action Research Model (adapted from Novakhta et al., 2023)

This study was carried out in two cycles, with each cycle consisting of the stages of planning, implementation, observation, and reflection (Arikunto, 2010). The research took place at SMAN 1 Palu, located at Jl. Jendral Gatot Subroto No. 70, Besusu Tengah, Palu Timur District, Palu City. The subjects of this study were 35 students of Class XI MIPA 6. The research was conducted during the second semester, in April 2025. The data collection techniques used in this study included: Observation, employing observation sheets for teacher and student activities to provide information about the learning process. Questionnaires, using a motivation questionnaire administered to students to measure their learning motivation in Biology. The instruments consisted of observation sheets (for teacher and student activities) and motivation questionnaires.

The data analysis technique applied was descriptive quantitative analysis. The students' motivation scores obtained from the questionnaires and the observers' notes were analyzed using the following formula (Arikunto, 2010):

$$\text{Learning Motivation} = \frac{\text{Total Score}}{\text{Maximum Score}}$$

The improvement in students' learning motivation was assessed based on the following criteria in Table 1.

Table 1. Criteria for Students Learning Motivation

Skala Penilaian	Kriteria
81-100%	Very High
61-80%	High
41-60%	Moderate
21-40%	Low
0-20%	Very Low

(Nasrah & Muafiah, 2020)

RESULTS AND DISCUSSIONS

RESULTS

The research data were obtained from the results of the learning motivation questionnaire administered to respondents three times during the learning process, namely before the intervention (pre-action), Cycle I, and Cycle II, as well as from the analysis of observation sheets on student and teacher activities recorded by observers. Based on data analysis, the following presents the percentage comparison between the pre-action stage, Cycle I, and Cycle II.

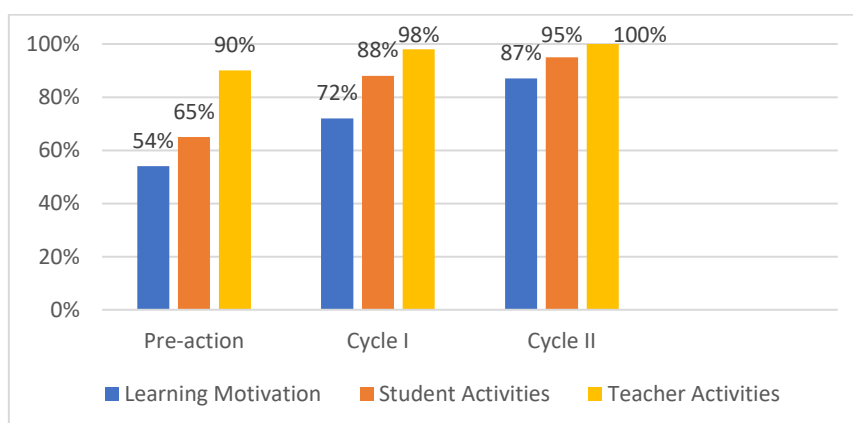


Fig 2. Percentage Comparison of Pre-Action, Cycle I, and Cycle II

The results of data analysis indicate that students' learning motivation during the pre-action stage was in the "Moderate" category, with a percentage of 54%. Student activity reached only 65%, while teacher activity was 90%. After the implementation of the Snowball Throwing model in Cycle I,

learning motivation increased to 72% (“High” category), student activity rose to 88%, and teacher activity reached 98%. Furthermore, in Cycle II, students’ learning motivation increased again to 87% (“Very High” category). Student activity also increased to 95%, and teacher activity reached 100%. These findings demonstrate a consistent improvement in students’ learning motivation in each cycle following the implementation of the Snowball Throwing model.

DISCUSSION

Based on Figure 2, an increase in students’ learning motivation was observed after the implementation of the Snowball Throwing model. These findings confirm that the Snowball Throwing model can significantly enhance students’ learning motivation. Prior to the intervention, students’ learning motivation was 54% (“Moderate” category). At this stage, students tended to be passive and less engaged in the learning process because instruction still relied on lecture and discussion methods. This finding is in line with Sardiman’s (2018) theory of learning motivation, which states that one factor contributing to low motivation is the use of monotonous teaching methods that fail to provide opportunities for active student involvement.

Subsequently, in Cycle I after the implementation of the Snowball Throwing model, students’ learning motivation increased to 72% in the high category, as they began to show interest in the game-based activity combined with discussion. Based on classroom observations, several students stated that the instructional model applied by the teacher greatly influenced their enthusiasm for learning. One student also expressed that “learning through throwing paper balls makes me more confident to ask and answer questions, whereas usually I remain silent when the teacher only explains.” However, some students still did not fully understand the rules of the game, the classroom atmosphere became temporarily unfocused, and group cooperation had not yet been optimal. Such conditions are commonly found when cooperative strategies are introduced for the first time and can usually be reduced through scaffolding and more structured instructions from the teacher. This finding is consistent with reviews of cooperative learning interventions, which emphasize that the success of cooperative strategies depends on classroom management and clear teacher instructions (Fernandez et al., 2020).

Based on the learning reflection, improvements were made in Cycle II, resulting in an increase in students’ learning motivation to 87% in the very high category. This indicates that students were motivated to actively engage in the learning process and were able to correctly answer each question that was thrown. Observation during the implementation revealed that students were eager to continue playing the paper-throwing activity because they were curious about the questions created by other groups, which prevented them from feeling bored during the lesson. This model not only fosters student engagement but also develops the ability to think quickly and accurately through an enjoyable game. This finding is consistent with the argument of Hidayat et al. (2023), who state that the Snowball Throwing model can enhance learning motivation from both cognitive and affective dimensions. The instructional model engages all students to actively participate in the learning process. Furthermore, students are trained to remain focused, collaborate effectively, and cultivate leadership qualities. This aligns with Astutik et al. (2021), who emphasize that the Snowball Throwing model is an instructional strategy that develops students’ leadership potential within groups and their skills in formulating and answering questions through an imaginative game of shaping and throwing snowballs. Snowball Throwing also trains students to become more responsive in receiving messages from others and conveying them to peers within the group.

In implementing the Snowball Throwing model to enhance learning motivation, it is essential to follow the instructional syntax so that teacher and student activities become more structured. Throughout the implementation of this model, both student and teacher activities contributed to the success of improving students’ learning motivation. The results from the pre-action, Cycle I, and Cycle II stages indicate that teacher activity was consistently carried out effectively, whereas student activity was still lacking during the pre-action stage. After the implementation of the Snowball Throwing model, student activity also improved. In the pre-action phase, the preservice teacher primarily employed lecture and discussion methods. Learning was dominated by diligent students who already had high motivation, while other students were less focused. Interaction between the preservice teacher and students was also limited due to lack of familiarity and hesitation. In Cycle I, when the Snowball Throwing model was introduced, students initially faced difficulties. However, in Cycle II, the

implementation of this instructional model showed that both teacher and student activities were very effective. Students were actively engaged in the learning process and demonstrated high enthusiasm for learning. This improvement occurred because students had become more prepared to participate in the process using the Snowball Throwing method. The classroom atmosphere became more conducive, allowing students to learn and play calmly, while the interaction between the preservice teacher and students developed positively. It was also evident that students' learning motivation increased, as they perceived that the instructional model applied by the teacher played a crucial role in creating a pleasant learning environment, thereby fostering their interest in participating in the lessons.

Based on the classroom action research employing the Snowball Throwing model conducted over two cycles, it can be concluded that the quality of learning improved. This was evident from the increase in students' learning motivation and the creation of a more comfortable learning environment. These findings are consistent with the results of Dewi et al. (2023), who reported that the application of the Snowball Throwing model helped students who were initially unmotivated become actively engaged and enthusiastic during lessons, even in sessions held at the end of the school day. This condition indicates that the Snowball Throwing instructional model can be applied by educators as an effort to enhance students' learning motivation, which is crucial for supporting academic achievement. Students with high learning motivation will strive to do their best in every opportunity (Hartati et al., 2021). Conversely, students with low motivation tend to display a lack of seriousness in learning.

Students' learning motivation can be fostered through the creation of an enjoyable learning environment. This can be achieved by applying the Snowball Throwing instructional model. One of the strengths of the Snowball Throwing model lies in its ability to create an engaging classroom atmosphere, which in turn enhances students' motivation to learn. Students become more enthusiastic and eager to respond to questions related to the subject matter. Moreover, the Snowball Throwing model also makes the classroom environment more relaxed and less rigid due to the presence of active discussions between students and the teacher. Practically, these findings emphasize that the Snowball Throwing model integrates effective elements of active learning (active participation, structured games) and cooperative learning (group collaboration), thereby enhancing motivation from both cognitive and affective aspects. The results of this study are consistent with international review studies, which indicate that cooperative and game-based learning interventions when implemented with clear syntax and sufficient scaffolding consistently improve students' motivation and engagement (Jaaska et al., 2022).

CONCLUSION AND SUGGESTION

Based on the results of the study, it can be concluded that the implementation of the Snowball Throwing instructional model can improve the learning motivation of grade XI MIPA 6 students at SMAN 1 Palu. For teachers, this model can be used as a practical alternative to increase classroom engagement, provided that the rules are clearly explained and classroom management remains structured. Future research may also investigate combining the Snowball Throwing model with other cooperative or technology-assisted approaches to expand its impact on both motivation and learning outcomes.

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