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Effectiveness of the STAD-Type Cooperative Learning Model Assisted by Baamboozle Game to Improve Students' Cognitive Learning Outcomes

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ABSTRACT

This study aims to determine the effectiveness of Cooperative learning model type STAD assisted by baamboozle game to improve students' cognitive learning outcomes. The type of research used is quasi-experimental using Posttest Only Nonequivalent Control Group Design. The population of this study were 254 students of class VIII SMP N 30 Padang. The samples of this study were students of class VIII H as the experimental class and students of class G as the control class. The data collection instrument used was the posttest of students' cognitive learning outcomes in the subject of effort and energy. The results of the data obtained were processed using descriptive analysis and inferential analysis. The results showed that the STAD type cooperative learning model assisted by baamboozle game was effective to improve students' cognitive learning outcomes, as evidenced by the difference in students' cognitive learning outcomes between the experimental and control classes.

1. Introduction

Education plays an important role in educating the nation. In essence, education includes educating, teaching and training activities. The success of learning in schools depends on the situation of teaching and learning activities and the activities of the students themselves in the learning process. In line with what is conveyed by Piaget, Bruner, and Vygotsky (Hamalik, 2014), knowledge and understanding are not obtained passively, but in an active way, through personal experience and experiential activities. Students are required to be more active in finding new information other than that delivered by the teacher.

Learning is a process of interaction that occurs between students and educators and learning resources in a learning environment so that the process of acquiring

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science and knowledge, mastering skills and habits, and forming attitudes and beliefs in students can occur (Djamaluddin et al., 2019). Learning that makes students the center of learning causes a low level of understanding of concepts which will have an impact on low students learning outcomes. One of the subjects that is often misunderstood by students is science subjects (Hidayat et al., 2019). Natural science is a science that develops from observing natural phenomena by finding out about natural phenomena that in everyday life. This shows that science learning must be learned through direct observation. The models and approaches used by teachers in teaching are generally the same for each material taught, so that the selection of models, approaches, and learning methods is not in accordance with the subject matter in science learning. The purpose of learning science is to foster students' attitudes which can be achieved by actively involving students in the learning process (Kurniasih, 2018).

The problem that often occurs in the learning process is the lack of student interest in learning, because they feel bored with monotonous learning, resulting in a lack of motivation and enthusiasm for learning (Kallesta et al., 2017). Most teachers only use conventional learning more dominantly with the lecture method so that students only sit passively listening to explanations from the teachers. Many facts in the field, science learning is one of the subjects that is less attractive to students because in science learning students are less able to develop the ideas and abilities they have (Yulistiana et al, 2020). When the teacher delivers the task, students find it difficult to answer the questions given by the teacher. If this continues, it will make student learning outcomes decrease.

Maximum learning outcomes certainly require integrity and several factors within and outside the individual. Learning outcomes will be obtained by students after carrying out the learning process with the teacher or through other learning resources. Learning outcomes include patterns of action, values, understanding, attitudes, appreciation and skills, which can provide changes so that it becomes better than before in students (Suprijono, 2015). In reality, not all students can achieve the expected learning outcomes. The process of science education in Indonesia is still less than optimal due to the low quality of education which can be seen from the TIMSS (The Trends in International Mathematics and Science Study) research in 2021 ranked Indonesia 38th of 45 countries and in 2015 ranked Indonesia 45th out of 50 countries with a score of 397 (Dewi et al, 2018).

Students learning outcomes can be improved by fostering interest in learning. Basically, interest in learning will encourage students to pay attention to lessons well. Students will be more enthusiastic in learning and make it easier for students to understand the lessons delivered by the teacher. So that this can make students achieve maximum learning outcomes and as expected (Mariani et al., 2022). Therefore, teachers need to use variations in teaching, one of them is by using a cooperative learning model. The cooperative learning model is a learning model that is widely used and is a concern and is recommended by educational experts. Slavin (2015) stated that the cooperative learning model that is easy to implement is the Students Teams Achievement Divisions (STAD) type cooperative learning model.

The STAD cooperative learning model uses small groups of 4-5 students. It begins with the delivery of learning objectives, delivery of group activity materials, quizzes, and group awards. In STAD learning, students will be more active in seeking and discovering their knowledge. The application of this STAD type cooperative learning model will be more interesting if collaborated with educational game-based learning media. According to (Widoretno, 2021) the impact of using educational games in learning is that it can increase concentration, develop reasoning or thinking power, and reduce stress levels in students. One of the educational game-based learning media that can be used in collaboration with the STAD type cooperative learning model is the baamboozle game.

Baamboozle game can be used to create quizzes with various formats and questions. This media is also designed to increase learning group activities and can involve students in their use activities. In line with (Darmawan et al., 2018) in his research stated that the STAD type cooperative learning model showed that student learning outcomes had increased, where the first cycle average score of students learning outcomes was 73.44 to 83.73 in the next learning outcomes.

The use of educational game-based learning media can reduce student boredom during the learning process and of course can divert attention to concentrate more so that students become more active and participate are interested in conducting research on these issues with the title “Effectiveness of the STAD Type Cooperative Learning Model Assisted by Baamboozle Game to Improve Students’ Cognitive Learning Outcomes” which aims to determine the effectiveness of the STAD type cooperative learning model assisted by baamboozle game in improving student cognitive learning outcomes, and determine whether there are differences in student cognitive learning outcomes between classes that apply the STAD model assisted by baamboozle game with classes that apply conventional learning.

2. Methodology

The type of research used is quasi-experimental with the research design Nonequivalent Control Group Design Posttest Only. The research was held at Junior High School 30 in Padang with a population of 254 students. The sample was determine by conducting a normality test and homogeneity test using test score data on the previous material. Based on the test results, two classes were obtained, namely class VIII G as a control class consisting of 32 students and class VIII H as an experimental class consisting of 32 students selected using random sampling technique. The research instrument used in this study was a test of students’ cognitive learning outcomes on effort and energy material. The test questions were in the form objective questions as many as 20 questions given after the learning process of effort and energy material was completed. Data analysis was carried out using descriptive analysis and inferential analysis with the help of the SPSS version 25 application.

Descriptive analysis in this study was used to see the data description of the absorption of students' cognitive learning outcomes. Absorbability is calculated from the ratio between the score obtained by students and the maximum score determined by the equation:

$$\text{Absorption} = \frac{\text{score obtained}}{\text{maximum score}} \times 100$$

The absorption category can be seen in table 1.

Table 1. Absorption Categories

Interval	Category
$85 \leq x < 100$	Very Good
$70 \leq x < 85$	Good
$55 \leq x < 70$	Pretty good
$40 \leq x < 55$	Not Good
$0 < x < 40$	Bad

(Hidayah et al., 2014)

Inferential analysis in this study was used to see significant differences in students' cognitive learning outcomes between classes that applied the STAD type cooperative learning model assisted by baamboozle game and classes that applied conventional learning. In this technique before conducting hypothesis testing, a prerequisite test is carried out first, namely the normality test using the Kolmogorov Smirnov and homogeneity tests using the Levene test assisted by SPSS version 25. After the data prerequisite test produces normally distributed and homogeneous data, hypothesis testing is carried out using the Independent Sample t-test technique which aims to determine the difference in the average values of the two samples.

3. Results and Discussion

The data analyzed in this study were the cognitive learning outcomes of students in the experimental class VIII H who applied the STAD type cooperative learning model assisted by baamboozle game and the control class VIII G who applied conventional learning on the materials of efforts and energy at Junior High School 30 Padang.

Absorption

From the research results that have been obtained, the absorption of experimental class students after applying the STAD type cooperative learning model and the control class applying conventional learning, can be seen in Table 2 below.

Table 2. Absorbency of Students' Cognitive Learning Outcomes

No.	Class	Absorption Percentage	Category
1.	Experiment Class	75,46%	Good
2.	Control Class	66,56%	Pretty good

Based on Table 2 above, it can be seen that there is a difference in absorption between the experimental class that applies the STAD type cooperative learning model assisted by baamboozle game with an average absorption of 75.46 in the category of good, and the control class that applied conventional learning with an average absorption of 66.56 was in the pretty good category. This shows that the absorption of the experimental class is higher than the control class.

Learning Effectiveness

Based on the absorption of the experimental class that applied the STAD type cooperative learning model assisted by baamboozle game and the control class that applied conventional learning on the material of efforts and energy, the category of student learning effectiveness can be found as in Table 3 below.

Table 3. Learning Effectiveness

No.	Class	Category
1.	Experimental class	Effective
2.	Control Class	Effective enough

As seen in Table 3, the effectiveness of learning in the experimental class by applying the STAD type cooperative learning model is in the effective category with an average absorption of 75.46%, while in the control class that applies conventional learning is in the moderately effective category with an average absorption of 66.56%.

Discussion

The improvement of students' cognitive learning outcomes is strongly influenced by students' good absorption of learning materials. Based on the percentage of student absorption in the experimental class and control class, it can be seen that the experimental class that applied the STAD type cooperative learning model assisted by baamboozle game was better than the control class that applied conventional learning. This shows that the use of STAD type cooperative learning model assisted by baamboozle game is effective in improving students' cognitive learning outcomes. With this learning model, students become more active in the learning process. The phases contained in the STAD type play a big role in improving students' cognitive learning outcomes, especially in the group award phase. Students in each group will be more motivated and compete to get the best ranking for their group so they can get an award.

The results of this study are also in line with the research study conducted by (Prastya et al., 2022) that the learning outcomes of students who applied the STAD type cooperative learning model increased in two cycles. The learning outcomes at the first meeting obtained a score of 72.70, then increased at the second meeting by obtaining an average score of 90.10. then supported by research conducted (Iskandar et al., 2022) that baamboozle game learning media as an evaluation tool can increase students' enthusiasm for learning and can develop student learning outcomes in science learning. Based on the data on students' cognitive learning outcomes, it was found that the absorption rate for

each indicator between the experimental and control classes varied, as shown in Figure 1.

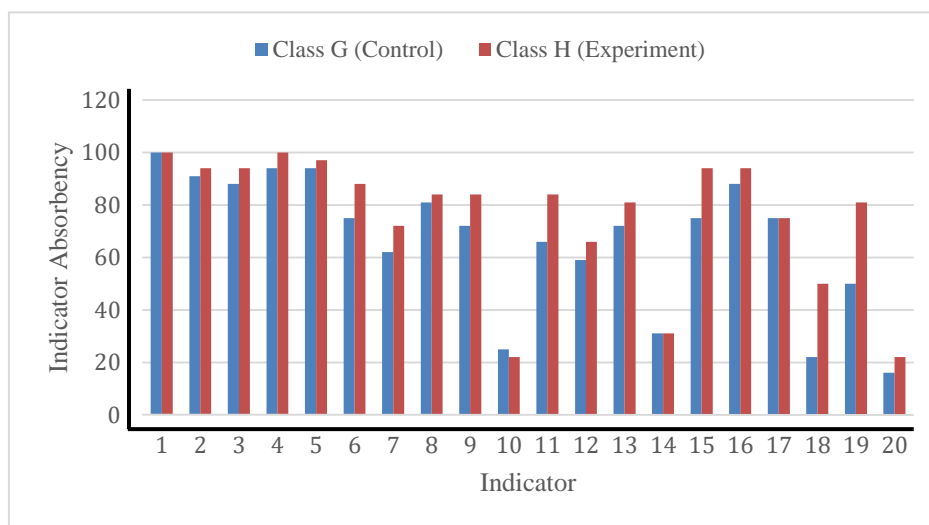


Figure 1. Comparison Chart of Absorption of Each Indicator

Figure 1 shows that the absorption of experimental class students is dominantly higher than the control class, this can be seen from the number of indicators that are completed in the experimental class more than the control class. In the experimental class, eight indicators were categorized as very good, seven indicators were categorized as good, one indicator was categorized as pretty good, one indicator categorized not good, and three indicators were categorized as bad. While in the control class there were six indicators categorized as very good, six indicators categorized as good, three indicators categorized as pretty good, one indicator categorized not good, and four indicators categorized as bad.

The results of inferential data analysis in this study aim as a reference for making decisions on research hypothesis. From the results of inferential analysis, it was found that both classes obtained a significance value $p > 0.05$. Based on the decision, the two classes are declared to be normally distributed and have the same or homogeneous variance.

After the prerequisite test is met, then hypothesis testing can be done. Hypothesis testing was carried out using the Independent Sample t-test technique which found that the significance value (Sig.2-tailed) was 0.001 where based in decision making if the $p < 0.05$ then H_0 was rejected and H_a was accepted. So it can be concluded that there is a significant difference in cognitive learning model assisted by baamboozle game and classes that apply conventional learning for students in grade VIII junior high school on the material of effort and energy.

4. Conclusion

Based on the results of the study, it can be concluded that the experimental class that applied the STAD type cooperative learning model assisted by baamboozle game obtained a higher average absorption value than the absorption in the control class. This proves that the STAD type cooperative learning model assisted by baamboozle game is effective to improve students' cognitive learning outcomes VIII grade junior high school on the material of effort and energy. Based on the conclusions that have been presented, the authors suggest: The use of the STAD type cooperative learning model assisted by baamboozle game can be used as an alternative that can be applied in the learning process at school, can be used as a reference for other researchers and it is advisable for the next researcher to examine different fields of science that are useful for improving the quality of education and getting better results.

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