



Effectiveness of Jigsaw Type Assisted with Card Problems on Learning Outcomes and Responsibilities of Student Material

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Abstract

The research aims to analyse the effectiveness of the implementation of cooperative learning of jigsaw-type with the card problem on learning outcomes and responsibilities of student cell material in high school. This is done because students ' understanding of the cell material is still lacking, about 60% of students have not reached the KKM. This research was conducted at the Sint Louis High School in Semarang at the time of school year 2019/2020. The samples in this study were all learners with saturated sampling techniques. The design of this research is One Group Pretest-Posttest Design. The results show the value of N-gain students in medium and high categories, the average character score of student responsibilities reaches good and very good category, so that cooperative learning of Jigsaw type assisted with card problem for effective learning outcomes and student responsibility character.

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INTRODUCTION

Based on the results of interview with high school biology teacher Sint Louis Semarang, it is revealed that 60% of students' cognitive outcomes in the cell materials are below the minimum of the minimal criterion ($KKM \geq 69$). The fact of the field shows that the character's responsibility is still low and is limited to knowledge. Many students do not have records related to the material that the teacher has submitted. Some students also do not prepare a reference book when learning begins. When the discussion done only a few students who pay attention and actively convey opinions. One of the efforts made to improve learning outcomes and the students' responsibilities in following the learning is done with variations in the use of the teaching model. To address the problem, researchers are trying to streamline learning using cooperative learning models of card-assisted jigsaw types.

RESEARCH METHOD

This research is a Pre-experimentation study with One Group Pretest-Posttest Design Research pattern, conducted at Sint Louis Semarang High School in the year 2019/2020. The sampling techniques used in this study were saturated sampling. Sugiyono (2015) When sampling is a sampling technique when the population of the population is used as a sample, it is carried out when it is relatively small. The sample in this study is the entire population of the class XI MIPA students consisting of XI MIPA 1 and XI MIPA 2. The variables in this study are variable free and bonded. The free variable in this study is cooperative learning type of Jigsaw assisted card problem on the material of the cell, while the variable is the learning outcome and the student responsibility character on the cooperative learning types of jigsaw assisted by the card problem on the cell material.

The stages in this study include planning, implementing and analyzing data. The data collection techniques in this study used tests, observation sheets and student self-assessment polls. The results of learning are obtained through pretest and posttest, while the observation sheets and polls are used to obtain student responsibility data. Before entering the experimental class, the test was carried out for calculation and analysis related to the reliability of the problem, the difficulty level of problem and validity.

Data analysis techniques include, N-gain test for students' learning outcomes and the calculation of the characters' poll scores of students.

RESULTS AND DISCUSSION

The results of research gained in this study include the value of students' cognitive learning outcomes (pretests and posttest values), and student responsibility assessment scores during the study.

Student Learning Outcomes (N-Gain)

Students' learning outcomes were obtained through pretests administration at the beginning of learning and posttests at the end of learning. Problem consists of 30 questions of multiple cell material and performed for 25 minutes. After the pretests and posttest values are obtained the N-gain test. N-Gain test results are shown in table 1.

Table 1 Results N-Gain test results cognitive learning on cooperative Learning Jigsaw type assisted with problem cards

Categories	Criteria	XI MIPA	
		Amount	%
$0,70 \leq N\text{-gain}$	High	22	33,3
$0,30 \leq N\text{-gain} < 0,70$	Are	44	66,7
$N\text{-gain} < 0,30$	Low	0	0

According to table 1 it is known that the N-gain value of both classes is in medium and high categories. The increasing learners' learning outcomes are influenced by several things, according to the Shah (in the Rijal & Bachtiar, 2015) stating that the outcomes of learning are influenced by three factors: internal factors, external factors, and learning approach factors. The method is one of the factors that greatly affects the outcome of student learning. Kasih et al (2019) states that cooperative learning of assisted Jigsaw types has an excellent influence in improving student learning outcomes.

The results of the analysis of Posttest value (table 1) show the classifications of the classical cognitive learning outcomes reaching 80.3% of the total students. These results indicate that the student has achieved a determined success indicator. The classification of classical learning results is said to be successful if there is a minimum of 75% of students reach the minimum deadline set (Marini et al., 2016). The average increase between the pretests and Posttest values occurs after a pre-assisted Jigsaw learning model is applied in learning. This is because Jigsaw learning models provide students with the opportunity to develop students ' thinking skills through discussion activities, doing tasks together, exchanging opinions. This is in line with the opinion of Kusuma (2018) stating that the Jigsaw learning model can develop a high level of students ' thinking skills so that it can improve students ' cognitive learning outcomes. Based on the analysis, it can be concluded that the the cooperative learning of the jigsaw type is assisted by effective questions regarding the student's cognitive learning outcomes on the cell material.

Character responsibilities

The character responsibilities of the students in this study were obtained through observation and a student self-assessment. The students ' responsibility scoring results after applying cooperative learning of the jigsaw type assisted with a Karto problem shown in table 2.

Table 2 Percentage of students ' responsibilities on learning

No.	Responsibility criteria	Student amount	Percentage
1.	Very nice	52	78,8
2.	Nice	14	21,2
3.	Nice enough	-	-
4.	Good little	-	-

Based on the results of the calculation of students ' responsibilities through observation and the poll of students ' responsibilities in table 2 shows that students ' responsibilities in a classical order have reached the criteria of the student's submission to a good category. As 59.1% of total students have a responsibility in excellent criteria and 40.9% of other students have a responsibility in good criteria. This shows that in addition to being effective on learning outcomes, cooperative learning of the type of jigsaw with help cards is also effective against the character responsibility of students because it has reached the classical survival of the students reached a good category. This is due to some of these things, in the unassisted jigsaw puzzle to require students to work in groups, so learners participate with the group members to reach the goal. Darwin et al (2017) states that Jigsaw learning models can take students ' responsibilities to their own learning and to learn others in understanding the material they provide, so that they are actively involved in Understanding and completing tasks in a group.

CONCLUSION

The application of jigsaw learning models assisted by effective question card to train the responsibility character of the students of class XI MIPA Siny Louis High School in Semarang for 2019/2020 on cell material with the number of student who have responsibility character with good and excellent predicate. The application of jigsaw learning models assisted by effective question card to learning outcomes of the students of class XI MIPA Siny Louis High School in Semarang for 2019/2020 on cell material with completeness of cognitive learning outcomes classically bt 80,3% and N-gain test reached medium and high categories.

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