The Effect Of The Integrated Think Pair Share Problem-Based Learning Model On Students' Cognitive Learning Outcomes Of Class X SMA

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ABSTRACT

The study aims to determine the effect of the integrated think pair share problem-based learning model on students' cognitive learning outcomes. This type of research design by quasi-experimental and pretest-posttest nonequivalent control group design. The population in this research were all students of X MIA SMA and the sample of this research were class X MIA 1 and class X MIA 3 SMA in the odd semester of the academic year 2022/2023. The analysis technique used for descriptive analysis to determine the score of students' cognitive learning outcomes and inferential analysis to test the research hypothesis. The results showed that the average score of the experimental class was higher than the control class of 0.75 in the experimental class and 0.52 in the control class. The results of the hypothesis test showed that 7.61 was greater than 1.67 then Ho was rejected, meaning that there was a significant effect of integrated think pair share problem-based learning model on students cognitive learning outcomes in class X SMA

Keywords: Cognitive Learning Outcomes, PBL Integrated TPS , Virus Material

INTRODUCTION

Education as a process that can influence students towards a better direction and can achieve the goals to be achieved, through education can improve human resources and can make people skilled in their respective fields. Biology learning is essentially a guiding process students toward their learning goals, and biology itself acts as a tool to help achieve that goal. Biology learning is currently focused on student learning processes. A good biology learning process allows students to achieve their learning goals, either individually or in groups. Learning activities should be designed to be centered on students while the teacher as a facilitator, various efforts can be made to improve the quality of education by developing process innovations learning (Jahidin, 2021: 4).

Efforts that can be made to improve the quality of education is by improve human resources, namely teachers. Teacher's ability to deliver learning to students is very influential on student learning outcomes and activities, so that teachers must be more innovative and creative in carrying out the learning process with using models, facilities and

infrastructure that are appropriate to learning materials (Kosilah and Septian, 2020: 1139). An effective learning process can be direct develop the potential of students through learning experiences, processes learning that involves students directly makes students capable explore the material received during the learning process. The involvement of students is directly able to develop the ability to think in the process solving problems so as to improve student learning outcomes (Faridah, et al., 2018: 90).

The model applied by the teacher in the learning process is very good however still not effective enough in improving student learning outcomes so it is necessary the right learning model in the learning process of students so that the goals are to be achieved can be implemented effectively. Based on student learning outcomes data still not optimal enough in this case related to the grades obtained by students after carry out the learning process. To solve this problem is necessary innovative learning design that has a strategy in developing abilities students, therefore conducted research on the influence of learning models Problem Based Learning (PBL) integrates Think Pair Share (TPS) in improving results students' cognitive learning.

METHOD

This type of research is quantitative research using a quasi-experimental design. The research design was pretest-posttest nonequivalent control group design. This research carried out from August to November 2022. Sampling process using a purposive sampling technique which is determined based on the average value of the results pretest students of each class X Mia. Analysis of students' cognitive learning outcomes data using descriptive analysis techniques and inferential analysis using the t test.

FINDING AND DISCUSSION

Table 1 Pretest-Posttest and N-Gain Students' Cognitive Learning Outcomes Using TPS integrated PBL model and PBL Model

Data	Experiment class			Control class		
	Pretest	Posttest	N-Gain	Pretest	Posttest	N-Gain
N	28,00	28,00	28,00	28,00	28,00	28,00
Max	50,00	90,00	0,87	65,00	80,00	0,71
Min	15,00	75,00	0,58	15,00	60,00	0,14
Mean	32,85	83,57	0,75	33,75	69,46	0,52
Mode	40,00	85,00	0,67	35,00	70,00	0,50
Median	35,00	85,00	0,77	35,00	70,00	0,53
Standard Deviation	9,37	4,68	0,08	13,09	5,32	0,13
Variance	87,83	21,95	0,01	171,52	28,40	0,02

Source: Researcher

Table 2 N-Gain Results for Each Indicator of Student Cognitive Learning Outcomes (C1-C6) with Using TPS integrated PBL Model and PBL Model

				Experiment class				
Indicator	*Max*	*Min*	$\overline{X}$	*Mo*	*Me*	*N*	*S*	S^2
C1	1,0	1,0	1,0	1,0	1,0	28,0	0,0	0,00
C2	1,0	0,3	0,9	1,0	1,0	28,0	0,1	0,03
C3	1,0	0,0	0,7	0,8	0,8	28,0	0,2	0,04
C4	1,0	0,0	0,6	0,5	0,7	28,0	0,3	0,10
C5	1,0	0,0	0,4	0,0	0,0	28,0	0,4	0,20
C6	1,0	1,0	0,7	1,0	0,8	28,0	0,3	0,10
				Control class				
Indicator	*Max*	*Min*	$\overline{X}$	*Mo*	*Me*	*N*	*S*	S^2
C1	1,0	0,0	0,8	1,0	1,0	28,0	0,3	0,10
C2	1,0	0,0	0,5	1,0	0,5	28,0	0,4	0,20
C3	1,0	0,0	0,4	0,2	0,4	28,0	0,3	0,10
C4	1,0	0,0	0,5	0,5	0,5	28,0	0,3	0,10
C5	1,0	0,0	0,4	0,0	0,0	28,0	0,4	0,20
C6	1,0	0,0	0,3	0,0	0,3	28,0	0,3	0,10

Source: Researcher

Based on the results of the N-gain statistical analysis shows that the average value of the results cognitive learning of students using the TPS-integrated PBL model in the experimental class obtained a higher score than the PBL model in the control class. Difference increase in students' cognitive learning outcomes because the learning model is integrated with TPS where thinking processes occur in a group by sharing information and motivating students to be more careful in doing work, explain ideas with evidence support, and increase student participation by discussing and sharing ideas from discussion results in the learning process (Rathakrishnan, et al., 2019: 1-2). TPS integrated in the PBL model, in the learning process students will be given problems in LKPD that will be solved using the TPS strategy, namely students will think about the problems given then students discuss the results of their thoughts with the group and then students will share the results of the discussion with other students so as to improve the thinking process owned by students. TPS is included in cooperative learning which can help students to think, then engage in group work and share opinions so as to encourage students to participate in the learning process (Hamdan, 2017: 88).

Based on the results of the descriptive pretest analysis shows that the average value of students the control class that uses the PBL model is relatively the same as the experimental class, because students have not received learning material and are still in the form of initial abilities learners. The value of the standard deviation and variance of the control class is higher than that of the class. The experiment shows that the pretest value of cognitive learning outcomes in the control class has a higher level of distribution than the experimental class so that the deviations are occurred in the relatively lower experimental

class. Posttest descriptive analysis results shows that the average value of the experimental class after the learning process with using the TPS-integrated PBL model is higher than the average value of the control class after using the PBL model, the standard deviation and variance of the experimental class were lower compared to the control class, which means the level of distribution of the control class pretest scores is more scattered compared to the experimental class. The difference in score difference between the pretest and posttest in both classes experienced an increase related to before and after implementing the learning process. Learning that uses the PBL model integrated TPS increases higher compared to the PBL model, because it is deep the use of the TPS-integrated PBL model trains students' deep thinking skills solve problems by using the TPS strategy where students think with form ideas that will be discussed with colleagues so that students can obtain the results of solving problems through the results of discussions and share them throughout class (Rathakrishnan, et al., 2019: 1-2).

Indicators of cognitive learning outcomes consist of 6 levels namely remembering (C1), understanding (C2), apply (C3), analyze (C4), evaluate (C5), and create (C6) (Ruwaida, 2019: 56-57). The results of the N-Gain analysis for each indicator of the cognitive domain of students in the experimental class as follows: a) The highest N-Gain indicator is C1 where students are able master well the indicators of learning outcomes. Indicator C1 or remember (C1) is an indicator that requires students to recall information regarding the learning that has been given, the level of the remembering indicator (C1) includes the level the very first so as to allow students to get the highest score on these indicators, Sudijono, (1996: 49-50) in Asrul, et al (2014: 99-100) states that the ability to remember is the ability to retrieve stored information such as knowledge in the form of terms, classifications, and types. b) The lowest N-Gain indicator namely the C5 indicator or evaluate, the indicator includes a difficult level of thinking in the cognitive domain where students must be able to make a judgment based on existing criteria and able to combine several elements into a unit (Haerullah and Hasan, 2022: 112). c) The average value of N-Gain in the experimental class namely 0.75 where the highest mean value is obtained from the experimental class using the TPS-integrated PBL model, the use of the TPS-integrated PBL model has increased higher than using only PBL. The TPS-integrated PBL model is the model problem-based by using thought processes, pairing, and deep sharing carry out learning (Lismaya, 2019: 19).

The results of the N-Gain analysis for each indicator of the cognitive domain of students in the control class as following: a) The highest N-Gain indicator is C1 with the highest score of all indicators of cognitive learning outcomes show that students have deep abilities recalling previously obtained information, the indicator remembers (C1) is an activity carried out by recalling data or information and also the ability to describe, recognize, define, and identify (Supratiknya, 2022: 9). b) The lowest N-Gain indicator is C5, the indicator is included indicator with the highest level of indicators of cognitive learning outcomes that require the ability to combine several elements into a single unit, the process involved in creating is generally coordinated with the student's learning experience What needs to be emphasized in this indicator is giving birth or producing, plan, design, and make

inventions (Haerullah and Hasan, 2022: 122). c) Value the mean N-Gain of the control class is 0.52, the control class uses the PBL model of learning outcomes

Cognitive enough to increase in each indicator, because in the learning process of the participants students solve their problems independently not in groups, PBL can assist students in transferring knowledge to solve problems and develop their thinking processes (Parmiti and Rediani, 2020: 44).

The results of hypothesis testing through the results of the t test analysis obtained that this matter was rejected shows that there is a significant effect on students' cognitive learning outcomes which uses the TPS-integrated PBL model. The combination of TPS-integrated PBL models can encourage students' thinking skills in learning-oriented activities issues and investigate various important social and knowledge issues and the use of TPS can build interaction between students through group discussions so that in-depth knowledge is formed, by applying TPS it improves taste students' self-confidence and responsibility because during the learning process they can share results his thoughts on other students (Hastuti, et al., 2020: 119). This is in line with research what has been done before are as follows: a) Rizkiwati, et al (2015: 260) in the results his research states that the Problem Based Learning learning model is combined with Think Pair Share is effective on student learning outcomes, obtained p-level data is smaller than 0.05 (p <0.05) which indicates that there is an effect of the PBL combined TPS learning model on learning outcomes. The influence obtained is inseparable from the Problem Based merging syntax Learning with Think Pair Share at the student orientation stage. b) Rahmatin, et al (2017: 249) states that there are differences in student learning outcomes after and before following the learning process applied to the PBL and TPS models, the two models has a positive effect on student learning outcomes. c) Rhomadhon, et al (2016: 46) states that the think pair share learning model uses the approach problem based learning has a significant effect on student learning outcomes, namely in the learning outcomes of the cognitive domain increased by 27.53 (experimental class) and 15.56 (class control).

CONCLUSION

The average cognitive learning outcomes of students using the TPS-integrated PBL model larger than that of the PBL model. The TPS-integrated PBL model has a significant effect significantly to the cognitive learning outcomes of class X high school students.

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