Application of Stad Type Learning Models to Improve Activity and Student Learning Outcomes

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ARTICLE INFO

A B S T R A C T

This research is motivated by the low activity and student learning outcomes in learning. One alternative that is used to overcome the low activity and learning outcomes of social studies subjects is by using the Student Team Achievement Division (STAD) type of cooperative learning model with LKPD assistance. The purpose of this study was to analyze student learning activities and outcomes using the STAD type cooperative learning model assisted by Student Worksheet (LKPD). This research was an experimental study using the Pre-Test Post-Test Control Group Design. The data used consists of primary and secondary data. The data were collected using test results of learning and observation sheets to determine student learning activities. The total population was 348 people with a sample size of 78 people with a purposive sampling technique. The method of analysis used the independent sample t-test. The results showed that the student's learning activity was declared active with a high category as long as the cooperative learning model type STAD was assisted by LKPD and the learning outcomes obtained a significance value of 0.000 with a significance level of 0.05. It can be concluded that there is an increase in student activity and learning outcomes using the STAD type cooperative learning model assisted by LKPD.

1. Introduction

Education is a reflection of the progress of a nation, the higher the culture of a nation, the higher the level of education of that nation. A great nation is a nation that pays attention to the education of its citizens (Utami, 2015). The teaching principle is the teacher's effort to create and condition teaching and learning situations so that students carry out learning activities optimally. Ginanjar (2019) stated that as the spearhead of education, teachers face to face with students who are required to have adequate competence. The use of teaching principles can be

planned by the teacher during the teaching and learning process, especially when student learning conditions have deteriorated (Faqih, 2012).

In the teaching and learning process, teachers as teachers and students as learning subjects are demanded for changes in knowledge, abilities, attitudinal values, and personal characteristics, so that the process takes place effectively and efficiently (Zaidah et al., 2012). The teacher as the core of education must be able to provide direction and motivation as well as facilities for students to advance education. Therefore, the teacher's role is very important to support the success of a student in every subject taught. Maharini (2013) states that on various experiences in the field, the causes of learning barriers to students are very complex so that the problems that arise are also complex such as models or learning methods, student learning activity problems, how about groups of students who have low ability and motivation and how about groups that have high ability and high motivation and others, which in the end as a benchmark is student learning outcomes.

Nanang (2010) revealed that learning activities are a learning process that must involve all psychophysical aspects of students both physically and spiritually so that the acceleration of behavior change can occur quickly, precisely, easily and correctly, both with regard to cognitive, affective and psychomotor aspects. In learning activities it can also include communication skills, emotional skills, language skills, group skills, ethics, morals, courage and spiritual skills (Junita, 2018)

Through the results of preliminary observations carried out at SMP Negeri 26 Pekanbaru, student learning activities in less active learning. Data obtained from preliminary observations were that the average student learning activity was 49 or 25%. These results are in the less active category. While student learning outcomes were obtained, from 39 students there were only 10 students (26%) who completed learning, namely obtaining a value of ≥ 78. Meanwhile, 29 students (74%) have not completed or scored <78. The learning outcomes of students are still categorized as low.

This is because the teacher has not used a learning model that can stimulate student learning activities. Mutia (2020) finds that the selection of the right, innovative and varied media will be able to attract students' interest in learning. Learning is still centered on the teacher (teacher centered), causing boredom and passivity of students in learning. Therefore, to overcome the problems that arise, teachers need to apply a learning model that can increase student learning activities so that learning outcomes can be achieved optimally. One alternative that is used to overcome the low activity and learning outcomes of social studies subjects is by using the Student Team Achievement Division (STAD) type of cooperative learning model with the help of LKPD, which is expected to increase learning activities and student learning outcomes.

STAD is a learning model that prioritizes group competition so it is very suitable to be applied to students to instill character and as an effort to vary the use of learning models (Setiogohadi, 2014). In addition to using the learning model, a

media that can be varied in the STAD-type cooperative model is also needed, namely the student worksheet (LKPD).

The use of a longer period of time which is a drawback of the cooperative model type STAD can be overcome by providing LKPD so that students can work and learn effectively and efficiently. LKPD can be in the form of a guide for cognitive aspect development exercises as well as a guide for the development of all aspects of learning in the form of an experimental or demonstration guide. The use of student worksheets can improve student achievement in stoichiometric material (Nuriyawan, 2016). The same thing was said by Lindarti, et al. (2010) that the application of cooperative learning is proven to improve physics learning outcomes. This is evident from the results of the calculation of the gain index difference test between the experimental and control groups obtained t count of 4.506 with p = 0.000 below 0.05, indicating the gain index of the two groups is significantly different.

Atna (2013) suggests that the application of STAD type cooperative learning can increase learning activities and students' cognitive physics abilities, which is seen from the increase in learning activities from 65.7% to 75.47% and the average value of learning outcomes from 60.83 to 81 25. Subrata (2016) states that there is an increase in the activity and learning outcomes of students. The purpose of the study was to describe the application of the STAD type cooperative learning model assisted by LKPD in increasing student activity and learning outcomes.

2. Methodology

This research was an experimental study using a pre test post test control group design. The research design can be seen in table 1.

Table 1. Pre-Test Post-Test Control Group Design Method

Class	Pretest	Treatment	Postest
Experiment	X_1	A	X_2
Control	X_3	B	X_4

Sugiyono (2010)

The research was conducted at SMP Negeri 26 Pekanbaru in the odd semester of the 2019/2020 school year. The study population was all students of class VIII, amounting to 348 people with a sample size of 78 people with a purposive sampling technique where 39 people from class VIII.1 were the experimental class and 39 people from class VIII.3 as the control class. Data analysis techniques for student activities were carried out by direct observation, which was analyzed using descriptive analysis. The student activity was measured by a percentage based on Sudijono's introductory statistical book (in Murni 2011). The formula for the percentage of student learning activities used for the direct observation sheet can be seen below:

$$P = (f / N) \times 100\%$$

Information
P = percentage of student activity per meeting
f = frequency of learning activities that often appear
N = number of students present

After obtaining the percentage of students who carry out activities, the activity category is based on the percentage that has been obtained. These categories can be seen in Table 2.

Table 2 Categories of student activity

No	Implementation value (%)	Criteria
1	81-100	Very active
2	61- 80	Active
3	41- 60	Pretty active
4	21- 40	Less active
5	0 - 20	Not active

Source: Riduwan (in Wahyu et al, 2017)

For learning outcomes using the N-Gain calculation after the pretest and posttest values are obtained from the scoring results, the N-Gain normalization acquisition is classified into three categories can be seen in table 3

Table 3. Classification of N-Gain values

$g > 0,70$	High
$0,30 \geq (g) < 0,70$	Moderate
$g < 0,30$	Low

Source: Hake (in Risa, 2016)

Normality test
The normality test used the Chi Square test (Kolmogorov-Smirnov test) with the help of SPSS 22 for windows at the 5% significance level. The decision to test for normality can be taken with the following criteria: 1) if the significance value is> 0.05 then the data is normally distributed, 2) if the significance value is <0.05 then the data is not normally distributed. The homogeneity test uses the Levene's test of error variance with the help of SPSS 22 for windows. The significance level used is 5% or 0.05 and the data is said to be homogeneous if the p-value (sig.)> 0.05.

Hypothesis testing
Hypothesis testing using statistical analysis program SPSS 22 for windows. Hypothesis testing using the independent statistical sample T-test with the testing criteria if sig <0.05 then H1 is accepted and if sig> 0.05 then H1 is rejected.

3.   Results and Discussion

Cooperative Learning Model type STAD Assisted by LKPD

LKPD is a guide that is often used by students to carry out investigative activities or problem solving. LKPD can be in the form of a guide for cognitive aspect development exercises as well as a guide for the development of all aspects of learning in the form of an experimental or demonstration guide. In learning the teacher divides students into 8 groups with heterogeneous abilities, there are high, medium, and low abilities which are divided based on the data of the students' daily test scores on the previous material. Each group consists of 4 or 5 students. After students occupy their positions, the teacher asks a representative from each group to take the LKPD. The teacher explains to students how to work on the LKPD and asks students to discuss and work together with group members to solve problems that exist in the LKPD. This LKPD is given to make it easier for students to achieve learning goals. The LKPD used in social studies lessons with material on ethnic diversity can be seen in Figure 1.

Figure 1. Student Worksheet

Student Learning Activities

Student learning activities towards cooperative learning model type STAD assisted by LKPD will be analyzed using descriptive statistics. Student learning activity data were obtained through observation sheets. The student learning activities that were observed were listening to the subject matter delivered by the teacher, discussing the material and working on the LKPD that was given in a discussion, Presentation of discussion results, giving comments or responses during the discussion, doing quizzes with their own abilities, making awards and concluding the material that had been given. The increase in the percentage of activity in the experimental class and control class can be seen clearly in Figure 2 below:
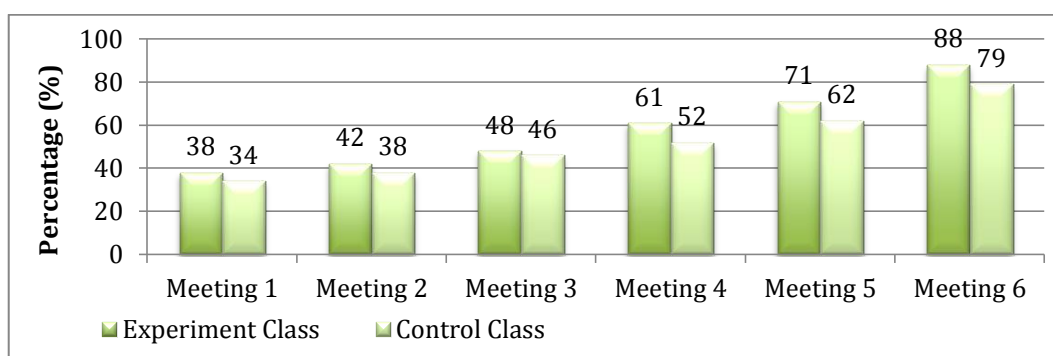
Figure 2. Increasing learning activities of students in the experimental class and the control class

Based on Figure 2, the learning activities of students in the experimental class and the control class have increased. There is a difference in student learning activities between the experimental class and the control class, where the learning activities of the experimental class students increase higher than the control class. It can be concluded that there is an increase in student learning activities by applying the STAD type cooperative learning model assisted by LKPD.

Student Learning Outcomes

In this study, descriptive statistical analysis is intended to describe the level of achievement of learning outcomes by applying the STAD type of LKPD-assisted cooperative learning model. The results of statistical analysis based on the learning outcome scores obtained by students by applying the STAD-assisted LKPD type cooperative learning model can be seen in table 4 as following:

Table 4. Data on the Results of Descriptive Statistical Analysis on Student Learning Outcomes

Statistik	Learning outcomes in the experimental class		Learning outcomes in the control class	
	Pretes	Postes	Pretes	Postes
Average	34,15	85,77	38,31	73,28
Standard Deviation	11,42	7,06	10,18	5,16
Range	44	28	50	24
Maximum Value	60	100	60	86
Minimum Value	16	72	10	62
Variance	130,40	49,87	103,69	26,63
Total Student	39	39	39	39

Source: Processed Data (2020)

Based on table 4, it shows that the learning outcomes of the participants' class have increased using the STAD type cooperative learning model assisted by LKPD with an average of 85.77 when compared to the control class, which is 73.28. The distribution data and frequency of students' scores in the experimental

class and control class in increasing the value of student learning outcomes using the gain normalization equation can be seen in table 5 below:

Table 5. Distribution of Gain Normalization Difference (Gain Score) Value of Learning Outcomes Experiment class and control class

Gain Normalization Coefficient	Category	Experiment class		Control class	
		%	Frequency	%	Frequency
$G \leq 0,3$	Low	0	0	0	0
$0,3 \leq g \leq 0,7$	Moderate	0,15	6	0,97	38
$G \geq 0,7$	High	0,85	33	0,03	1
Number of students		39		39	
Average Gain value		0,8 (high)		0,6 middle	

Source: Processed Data (2020)

In table 5, it can be seen that the average Ngain score for the experimental class is 0.8, which means that the experimental class has a relatively high increase in learning outcomes, while the control class gets a NGain score of 0.6 which means that the increase in learning outcomes in the control class is classified as moderate. So it can be concluded that there is an increase in student learning outcomes using the STAD type coopertive learning model assisted by LKPD.

Normality Test

The normality test was performed using the Kolmogorov-Smirnov test. Normality testing is also calculated using the SPSS 22 for windows application at the significance level $\alpha = 0.05$. The normality test can be seen in table 6.

Table 6. The results of the pretest and posttest data normality test for the experimental class and the control class

Class	Variabel	Significance value		Decision
		Pretes	Postes	
Eksperimen	Learning outcomes	0,242	0,453	Data is normally distributed
kontrol	Learning outcomes	0,808	0,272	Data is normally distributed

Source: Processed Data (2020)

Table 6 above shows that the calculated L value in the control class in the pretest and posttest is 0.808 and 0.272 then H0 is accepted, which means that the data is normally distributed. Likewise in the experimental class where the pretest and posttest with p value 0.242 and 0.453> 0.05 then H0 is accepted, which means that the data is normally distributed. Because all control and experimental classes in the pretest and posttest were normally distributed, the normality assumption was fulfilled.

Homogeneity Test

This test was carried out using Levene's test of error variance using the help of SPSS 22 for windows. The significance level used is 5% or 0.05 and the data is said to be homogeneous if the p-value (sig.)> 0.05 can be seen in table 7.

Table 7. Test of Homogeneity of Variances

learning outcomes

Levene Statistic	df1	df2	Sig.
3,580	1	76	,062

Source: Processed Data (2020)

From the post-test data in the two sample classes using the Levene's test of error variance, a significance value of 0.062 was obtained. So it can be concluded that the post-test of the two sample classes is homogeneous.

Hypothesis Testing

Hypothesis testing is done using the independent sample t-test. From the calculation results obtained a significance value of 0.000 with a significance level of 0.05. Because 0.000 <0.05, Ho is rejected and Ha is accepted, so it can be concluded that there is an effect of the application of the STAD type of LKPD-assisted cooperative learning model on student learning outcomes.

Discussion

Application of the STAD Type Cooperative Learning Model assisted by LKPD
Cooperative learning model type STAD assisted by LKPD has an influence on student learning outcomes and student learning activities. That the average student learning outcomes with the cooperative learning model type STAD assisted by LKPD get results above the KKM while student learning activities are classified as active with a high level of activity. STAD type cooperative learning emphasizes activities and interactions between students to motivate and help each other in mastering the subject matter so that the collaboration that occurs will involve all group members (Karim, 2012). In the STAD type of cooperative learning model with LKPD assistance requires students to have the ability to communicate and group process skills.

Slavin (2010) mentions the steps in implementing the STAD type of cooperative learning model, namely class presentations, teams, quizzes, individual improvement points and group awards. With the team stage, it provides opportunities for students to interact with each other. Students can work together, discuss with each other to understand the material being studied. During the presentation, group members have their respective roles. This is in accordance with the benefits of STAD that students are taught to be committed to group development and respect and trust each other in their group (Imas, 2014). This is reinforced by Rahmatun's (2014) opinion that group failure and success is the responsibility of each group member. Group awards make students try to be better for their group and try to get the reward or award.

The application of the cooperative model type STAD accompanied by LKPD can also increase good cooperation between students in solving problems given by the teacher, and students have a good attitude of responsibility in completing their

tasks during the learning process. The opinion of the experts above strengthens the results of this study that the application of the type of STAD cooperative learning model assisted by LKPD is effective in increasing the activities and learning outcomes of students.

Student Learning Activities

The use of the observation sheet to determine student activities while learning is in progress. To find out student learning activities, an observation sheet consisting of several indicators is used, namely listening to the material, discussing the material and working on student worksheet, percentage of discussion results, providing comments or responses, doing quizzes.

The increase in student activity was also felt by researchers when students were asked to discuss and present it in front of their other friends, students looked more orderly when discussing and were able to present the results of their discussions using language that was good, concise, clear, and easy to understand, and behaved politely. Laksmi (2011), said that the characteristics of science that differentiate it from other learning are providing skills (psychomotor), the ability for scientific attitudes (affective), understanding, habits and appreciation in finding answers to a problem.

Based on the results of descriptive analysis, it is known that the learning activities of students after the application of the STAD cooperative learning model increased with an average learning activity of 38%, 41%, 48%, 61%, 71% and 88% for the experimental class. Whereas for the control class the increase in learning activities of students was 34%, 38%, 46%, 52%, 62% and 79%. This increase in learning activities occurs because of the high active role of students with the collaboration between one individual and another in a group. Yuli (2016) argues that the implementation of the STAD model can increase the learning activities of social studies students. In the first cycle, the average percentage of student learning activities was 46% with a low level of success, while in the second cycle the average percentage of student learning activities was 70.4% with a good level of success. The cooperative learning model type Student Teams Achievement Divisions (STAD) assisted by worksheets has the character of being able to increase student learning activities (Atna, 2013).

Student Learning Outcomes

Based on the results of inferential statistics using the free sample t-test formula (independent t-test) that there is an effect of the application of the STAD type cooperative learning model on student learning outcomes. Based on the coefficient table (α), the p-value (significance) = 0.003, with a significance level of 0.05, so comparing the p value and the significance level, it turns out that p-value = 0.013 <0.05, so Ho is rejected and H1 is accepted. Dwi (2015) reported that the average student learning outcomes in the trigonometric comparison material using the STAD type cooperative learning model assisted by LKS had achieved classical learning completeness.

From all the discussions above, it can be concluded that there is an effect of the application of the STAD type of LKPD-assisted cooperative learning model on the activities and learning outcomes of students, indicating that variations in learning models can affect student learning activities and outcomes so that educators need to apply various other learning models that can provide a positive influence on increasing the activity and learning outcomes of students.

4.   Conclusion

This research shows that by applying the cooperative learning model type STAD assisted by LKPD during learning can increase the average learning activities of students. The cooperative learning model type STAD assisted by LKPD during learning can increase the average learning outcomes of students. Cooperative learning model with LKPD-assisted STAD tip can be an alternative learning model that can be applied to increase student activity and learning outcomes, especially related to social studies learning. As a material for consideration in order to improve the quality of education through a learning model that can change student activities and learning outcomes towards a better or increased direction.

References

Atna, F. V. M., Surantoro, & Elvin, Y. E. (2013). Penerapan Model Pembelajaran kooperatif Tipe STAD Berbantu LKS Berkarakter Untuk Meningkatkan Aktivitas Belajar. *Jurnal Pendidikan Fisika,* 1(2), 45-56

Dwi, O. (2015). Pengaruh Penerapan Model Pembelajaran Kooperatif Tipe STAD Berbantuan LKS Terhadap Hasil Belajar dan Aktivitas Belajar Siswa. *Jurnal Pendidikan Informatika dan Sains,* 4(2), 80-92

Faqih, A. (2012). Pengkonstruksian konsep fisika melalui pembelajaran Student Teams Achievment Division (STAD). *Jurnal Penelitian Fisika dan Aplikasinya (JPFA),* 2(2), 35-44

Ginanjar, A., Saragih, S., & Kartini, K. (2019). Effectiveness of learning with scientific approach in cooperative model of STAD-based type lesson study. *Journal of Educational Sciences*, *3(2),* 249-259.

Junita, D., Suarman, S., & Kartikowati, S. (2018). Accomplishment motivation and soft skill related to learning achievement. *Journal of Educational Sciences*, *2(2),* 83-89.

Karim, S. (2012). Penerapan Model Pembelajaran Kooperatif Tipe STAD (Student-TeamAchievement-Division)   untuk   Meningkatkan   Prestasi Belajar dan Kerja Sama Siswa. *Jurnal Pengajaran MIPA*, 17 (2), 108-116

Lindarti., *Achmad A. H., Raden, O*. (2010). Penerapan Pembelajaran Kooperatif Tipe STAD (Student Teams Achivement Division) dalam Upaya Meningkatkan Hasil Belajar Fisika pada Konsep Optika Geometris. *Jurnal Berkala Fisika Indonesia*, 2(2), 82-94

Maharini, I. G. A. D., W. Lasmawan., & I. M. Sutama. (2013). Pengaruh model pembelajaran koperatif tipe stad terhadap hasil belajar PKN ditinjau dari

motivasi berprestasi siswa Kelas 4 SD Di Gugus I Kuta Kabupaten Badung. e-Journal Program Pascasarjana Universitas Pendidikan Ganesha. *Jurusan Pendidikan Dasar*

Mutia, L (2020). Development of Blog-Based Audio Visual Learning Media to Improve Student Learning Interests in Money and Banking Topic. Journal Educational Sciences, 4 (2), 436-448

Nanang, H., & Cucu,S. (2010), *Konsep Strategi Pembelajaran*. Refika Aditama. Bandung

Nuriyawa, H., Ashadi., & Widiastuti, A, E. S., (2016). Penerapan Model Pembelajaran Problem Posing dilengkapi Media Pembelajaran Lembar Kerja Siswa (LKS) untuk Meningkatkan Prestasi Belajar dan Kemampuan Proses Sains Siswa pada Materi Stoikiometri Kelas X Semester Genap SMA Negeri 1 Sukoharjo Tahun Pelajaran 2015/2016. *Jurnal Pendidikan Kimia (JPK), 5 (3)*

Slavin, E. R. (2010). *Cooverative Learning Teori*. Riset dan Praktik. Bandung: Nusa Medi

Setiogohadi. (2014). Penerapan model pembelajaran kooperatif tipe stad untuk meningkatkan aktivitas dan hasil belajar IPA siswa Kelas VII.2 SMP Negeri 24 Palembang. *Jurnal Inovasi dan Pembelajaran Fisika*, 1(1)

Sugiyono. (2010). *Metode Penelitian Pendidikan.*Bandung: Alfabeta

Risa, H. (2016) Peningkatan Aspek Sikap Liletrasi Sains Siswa SMP Melalui Penerapan Model *Problem Based Learning* Pada Pembelajaran IPA Terpadu. *Edusains*. 8 (1) , 91-97

Utami, S. (2015). Peningkatan Hasil Belajar Melalui Pembelajaran Kooperatif Tipe STAD Pada Pembelajaran Dasar Sinyal Video. *Jurnal Pendidikan Teknologi dan Kejuruan*. 22 (4), 427 - 431

Yuli, I, S. (2016). Implementasi Model STAD Untuk Meningkatkan Hasil Belajar Dan Aktivitas Siswa Mata Pelajaran IPS. *Jurnal Teori dan Praksis Pembelajaran IPS*. 1 (1), 45 - 51

Zaidah, M. P., & Syamsu. (2013). Pengaruh model pembelajaran kooperatif tipe Student Teams Achievment Division Berbantuan Media Kartu Alir Terhadap Hasil Belajar Fisika Siswa Kelas VIII SMP Negeri 2 Tomini. *Jurnal Pendidikan Fisika* Tadulako (JPFT), 2 (2), 17-22