The Influence of Self and Peer Assessment on Science Learning

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Article Info	Abstract
	Environmental conditions around the individual is very influential in this type of social learning patterns. The aims of this study were to identify the influence of self and peer assessment on science learning. This research used post test only control design. The result of the analysis of data Showed that; (1) 50% of the 30 students in the experimental class were able to do a self-assessment activities well; 56.67% of the 30 students in the experimental class were able to do peer assessment activities well; and 26.67% of the 30 students in the control class were able to do self-assessment activities well. (2) 100% of the 30 students in the experimental class were able to do a self-assessment of the science learning outcomes well; 93.3% of the 30 students in the experimental class were able to do peer assessment of the science learning outcomes well; and 73.3% of the 30 students in the control were able to obtain a good score of science learning outcomes according to the teacher assessment. The result results show that the application of self and peer assessment has an effect on students' learning activity and outcomes. The conclusion is that the application of self and peer assessment has an effect learning of science. It is necessary to exercise this assessment periodically during the learning activity. The research should combine students' assessment with that of reviews their teacher by 50% to obtain accurate learning outcomes.

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INTRODUCTION

Science learning achievement shown by Indonesian students in the school are generally less satisfactory. Gonzales, et al (2008) and Martin, et. al. (2012) demonstrated the achievements of science junior high school students in Indonesia was ranked 35 on the 2007 TIMSS reports from 48 countries and ranks 40th of 53 countries in the TIMSS report 2011. The low quality of education can also be seen in PISSA 2009 and 2012. Indonesia was ranked 60 (OECD, 2010) and rank 64 (OECD, 2014) from 65 countries. Science learning achievement unsatisfactory This is one of the concerns that need completion.

One settlement or solution to lower educational achievement is the use of assessment involving a student. Self-assessment (SA) and peer assessment (PA) is used to improve understanding of the concept. Stan and Manea, (2015) confirms the SA is trying to predict the frequency of students in her abilities. Fahimi and Rahimi (2015) confirms SA is the student's ability to identify strengths and weaknesses and improve on their own performance. Harrison (2010) confirms the PA is an individual assessment that considers labor standards with the performance of his own friends.

Research SA and PA has been studied by some experts and demonstrate the potential of SA and PA in learning. Tsonkova, et al (2013) showed SA and professional quality does not have a universal character, but it depends on each individual. Limone (2012) said "learning by PA in addition to foster interaction and communication between participants, also managed to influence students' motivation to learn". Ueki and Ohnishi (2016) shows the data visualization SA and PA allows a person aware of several factors that help improve the learning outcome statements.

Bandura is the theory underlying this research. Bandura (1986) confirmed virtually all human learning activities rather than through direct experience, but rather the result of his observations of the behavior of others. According to Bandura process of observing, imitating the behavior and attitudes of others as a model of action learning. Bandura's theory explains human behavior in the context of continuous reciprocal interaction between cognitive, behavioral and environmental influences. Environmental conditions around the individual is very influential in this type of social learning patterns. This study aims to: (1) identify the SA to the student activity score; (2) identify the PA against the score of student activity; (3) identify the SA to score IPA student learning outcomes; (4) identify the PA to score IPA student learning outcomes.

METHODS

This study is a quasi-experimental design with posttest only control design. The collection of scores post-test on classroom experiments were conducted with SA and PA, while the control class with TA. The study population was a class IX student of SMPN 26 Semarang academic year 2016/2017, which consists of eight classes of grade IXa-IXh. Samples are taken as two classes: one class experimental and one control group. The sampling technique was conducted cluster random sampling. The independent variable in this study is SA and PA (X), while the dependent variable is the activity and learning outcomes IPA (Y).

Data collection technique used observation and testing, data collection instruments using a scale of psychology SA and PA, checklists student activities, and problems of static electricity material tests. Instruments SA and PA psychology scale used to determine students' perceptions of SA and PA. The collection of material science learning outcomes scores static electricity carried by SA, PA, and TA. The test method used to obtain data on the value of the learning outcomes such as student test scores, both experimental class and control class. These tests form the description as many as 10 items. Analysis of the data used to determine the effect of the application of SA and PA in the activities and learning outcomes IPA. Steps to be taken by comparing (1) the activity of SA and PA (2) learning outcomes IPA SA and PA and TA.

RESULTS AND DISCUSSION

The average score of student learning activities based SA 12.40; PA 12.59 and SA control (SA1) 10.9 (maximum score 16). This means that 77.5% of 30th graders SA experiment capable of doing well; 78.69% of the 30 students of the experimental class is able to perform well PA; and 68.12% of the 30 control class capable of performing SA well. Based on these data known to students admitted to the benefits of SA and PA to the learning activities based on the visual aspect, verbal, listening, and writing. Benefits of SA and PA to the activity shown by the number of scores.

Table 1. Data Anava Learning Activities

	Sum of square	df	Mean square	F	Sig.
Groups between	50,556	2	25,278	4,513	0,14
Within groups	487,267	87	5,601		
Total	537,822	89			

Table 1 describes F_{count} 4.513 > 3.10 means that H_0 is rejected. It can also be set based on a probability value listed in the column of significance. Based on the results obtained anava probability of 0.014 (0.014 < 0.05) mean H_0 rejected. It can be concluded that there is a significant difference from the application of the SA and PA.

SA and PA effect on student learning activities. This is evidenced Boud (2013) identified SA requires students to use both reflective and metacognitive skills". Application of SA and PA positive benefit to the students, so that students are active in the move; curiosity and critical reading and speaking; being open to receiving feedback; honest about work and judge; as well as self-confident and responsible of scores. Ueki and Ohnishi (2016) supports the statement that the SA and PA allows a person aware several factors that improve learning outcomes. King (2007) asserts trigger communication and elaboration of cognitive processes, causing the students to learn well.

Criteria score learning activities are divided into four levels, namely; (1) less (0-4); (2) sufficient (5-8); (3) either (9-12); and (4) very good (13-16). The data shown in Figure 1.
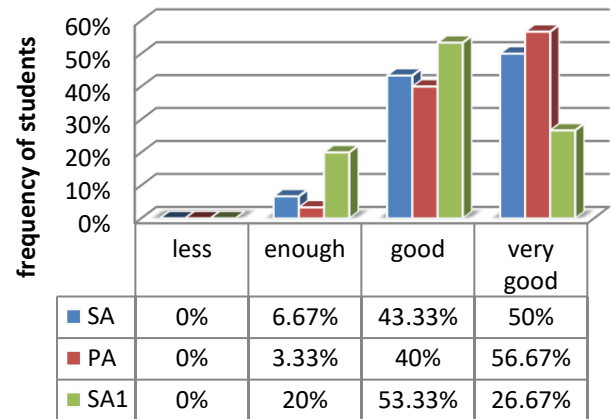

	less	enough	good	very good
■ SA	0%	6.67%	43.33%	50%
■ PA	0%	3.33%	40%	56.67%
■ SA1	0%	20%	53.33%	26.67%

Figure 1. Using Student Activity Score SA, PA and SA1

Figure 1 shows at 50%; 56.67%; and 26.67% of students feel the positive benefits of learning activities that have been carried out. The positive benefits SA and PA are students become more active in reading, speaking, responding during these discussions, and makes the task carefully and understand the material being taught.

Some of the obstacles in the implementation of SA to the activity that is; (a) students are not accustomed and trained, then there is a possibility that the student made a mistake in judgment; (b) there is the possibility of subjective students in assessment, due to pressing desire to get good grades. (c) when the evaluator to provide feedback to students assessed in oral form, the assessor only offensive weakness of the parties assessed.

Research outputs strengthened by the constructivism learning theory, which emphasizes the students' activity in learning. Not only during the learning process but also the assessment process that occurred during the study. Freire (1999) confirmed the learning process between teachers and students is the relationship of the subject with the subject. The statement affirmed that students should be given a "place" that is flexible in assessing himself. Students are active subjects who must continue to

learn to be mature and intelligent in all conditions.

The average score of science learning outcomes based SA 86; PA 85; and teacher assessment (TA) 83 (maximum score 100). This means that as much as 86% (SA); 85% (PA) and 83% (TA) students can receive the benefits of SA; PA and TA to the learning outcomes based on materials science atom; electrical charge; and the electric field.

Table 2. Data Anova Results

	Sum of squares	df	Mean Square	F	Sig.
Between groups	122,192.	2	61,096	4,705	0,11
Within groups	1129.709	87	12 985		
Total	1251.901	89			

Table 2 describes F_{count} 4,705 > 3,10 mean H_0 rejected. It can also be set based on a probability value listed in the column of significance. Based on the results obtained anava probability equal to 0.011 (0.011 < 0.05) mean H_0 rejected. It can be concluded that there is a significant difference from the application of the SA, PA and TA.

SA and PA also influence the students learn science. It is supported by Keller (2016) confirmed the students get good grades tend to be influenced by the ability of SA. Burns and Bulman (2000) states, through the SA students have metacognitive process where students are aware of the strategy and learning behavior. Boud (2013) states SA allows students to monitor and measure individual knowledge and understanding of the specific concepts. However, according to Currie et al (2010) PA engineering skills more appropriate than SA. Liu and Carless (2006) PA followed by feedback will facilitate self-reflection and developing their potential. Thanh and Gillies (2010) added when students are involved in the assessment process, students also learn to monitor learning closer.

Application of SA and PA positive benefit to the students, so that students can master the material that has been taught. This was confirmed by Gielen (2015) stated that the results of feedback varies friends during the PA have an impact on student learning outcomes. Masek

(2015) states SA, and PA have the scores higher than the scores given by the teacher. Ueki and Ohnishi (2016) states SA and PA allows students aware of some of the factors that help improve learning outcomes.

Benefits of SA; PA and TA to learn science results shown from the number of scores. Criteria score IPA learning outcomes can be divided into five, namely: (1) very less (0-20); (2) less (21-40); (3) sufficient (41-60); (4) well (61-80) and (5) a very good level (80-100). The data shown in Figure 2.
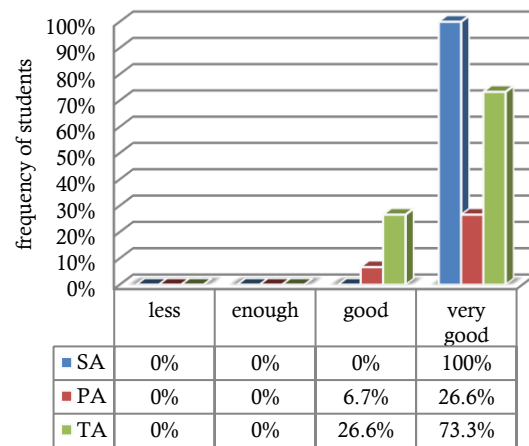

	less	enough	good	very good
SA	0%	0%	0%	100%
PA	0%	0%	6.7%	26.6%
TA	0%	0%	26.6%	73.3%

Figure 2. Scores of Science Learning Outcomes Using IPA SA, PA and TA

Figure 2 shows at 100%; 93.3% and 73.3% of students experience the positive benefits of learning activities that have been carried out. SA positive benefits, PA and the TA that students can master the material that has been taught.

McLeay and Wesson (2014) states there are constraints on the use of PA fair and consistent with the group's performance that involve a heterogeneous population. Some of the obstacles were found in the implementation of SA and PA in this study. First, the ability of students in SA are doubts about his own ability. Falchikov (2013) considers that SA is one kind of skill. SA skills requires practice for further development so that students become a good tester.

Second, the acceptance of the process of grading students. There are differences between students proficient with a slow learner in delivering value to its work. Mary (2007) identified that there is a low reliability in SA, but

it can be anticipated by the teacher. Teachers can discuss with students what aspects should be assessed. The agreement is important that both parties have the same standards in the assessment process.

Third, when the evaluator to provide feedback to assessed in oral form, the assessor only offensive weakness of the parties assessed. Although the feedback given purely constructive. This situation is reinforced by the social condition of people with less training have an open mind to criticism. The biggest problem is when those who rated retaliation to another student who suggests just the only drawback. Thus, the PA will be the arena for each other down.

Fourth, SA and PA can result in anxiety in specific individuals. Anxiety arises if students do not have enough knowledge to judge. Assessment of a high status in the Taxonomy 1956 in the realm of knowledge. In order to be a good evaluator of students must master the material and understand the criteria applied. Falchikov (2013) states SA is a skill that requires practice for further development so that students become a good tester.

Fifth, there is the possibility of subjective students in assessment, due to pressing desire to get good grades. This study should be repeated. This is done in addition to getting a good result also avoids subjective students in the assessment. The statement was supported by Shahbodin, et al (2013) suggest students prefer the PA instead of SA. It is also recognized by Frank and Barziali 2014 that the PA can motivate learning in a team. Shearen (2012) confirmed the SA will be few who get high scores if given by a good one.

Results of the study confirmed the presence of social learning theory developed by Albert Bandura, 1986. An individual to learn a lot about the behavior through imitation/modeling, even without the amplifier though. The learning process of this kind is called "observational learning" or learning through observation. Feedback from friends facilitate student self-reflection and developing capabilities. Students can also find out the perception of his friends on the materials studied (Liu & Carles, 2006).

CONCLUSION

Based on the analysis of the variables of self-assessment, peer assessment, student activity and student learning outcomes IPA can be summarized as follows. (1) Average SA's ability to learn activity score higher than the score of the learning activities in the classroom control. (2) Average PA's ability to learn activity score higher than the score of the learning activities in the classroom control. (3) average ability IPA SA to the learning outcomes of students is higher than the results of studying science in grade control. (4) Average PA's ability to learn science students' results are higher than the results of studying science in grade control.

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