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Development of Physics Teaching Instruments Belong to Cooperative Group Investigation Model to Improve Students' Self-Efficacy and Learning Achievement

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ABSCTRACT. This study aims to produce physics teachinginstruments with cooperative learning model type group investigation to improve students self-efficacy and learning achievement. Development of teachinginstrumentsusing Kemp model. The experimental design uses a one-pretest-posttest design model with three time replications. Subjects in this study are teachinginstruments and students of class XI MIPA. This research was conducted at SMA Negeri 3 Singaraja-Bali in the academic year of 2017/2018. Data were collected using validation method, questionnaire, observation, questionnaire and test. Data analysis techniques used are qualitative descriptive analysis and parametric statistical analysis. The results showed that the developed teachingintruments were valid, practical, and effective.The validitywas indicated by the average scores in a good categoryforlesson plan, BAS, student worksheet, achievement test and self-efficacy questionnaire.The practicisibilitywas showed by: (a) a good implementation of the lesson plan, (b) student activity is in excellent category, (c) the readability of BAS and student worksheet are in moderate categories, and (d) the obstacles during the learning activities can be overcome.The effectiveness was indicated by: (a) students' learning achievement has increased significantly; (b) students' self-efficacy has increased significantly; and (c) students respond is positive to the learning instruments and learning activity. In conclusion, physics learning instruments with cooperative learning model type group investigation can be used to improve students' self-efficacy and learning achievement.

Keywords: ***Cooperative learning, group investigation, learning achievement, self-efficacy***

INTRODUCTION

School as a formal educational institution is a vehicle for learners in developing their potential. Schools organize teaching and learning activities that can build students' attitudes, knowledge, and skills. Students are expected to actively process in developing their potential, in order to change the mindset and positive behavior, so that the achievement of learning achieved becomes more optimal. Achieving a more optimal learning achievement characterizes improving the quality of education. The Government has made many efforts to improve the quality of education in Indonesia, among others: (1) implementing the nine-year compulsory education program; (2) curriculum renewal; (3) improving the professionalism of teachers by implementing Teacher Professional Education and Training (PLPG); (4) carry out the upgrading for teachers; (5) providing School Operational Assistance Fund (BOS) and scholarships; (6) providing facilities and infrastructure facilities; (7) providing teacher and student handbooks; and (8) to carry out the competition or the Olympics as an appreciation event for outstanding students.

In actuality, the achievement of Indonesian students' learning in the International Trends in International Mathematics and Science Study (TIMSS) study is less encouraging in the number of reports issued by TIMSS. TIMSS analysis of 2015 shows that Indonesia achieved the score of 397 points and ranked 45 out of 48 participants (Kemendikbud, 2016). The average Indonesian student score is always below the average score of 500 and only reaches Low International Benchamark. With these achievements, the average Indonesian student is only able to recognize a number of basic facts but has not been able to communicate and link various topics of science, let alone apply complex and abstract concepts. This shows that the achievement of science achievement of Indonesian students in general at the international level is still very low.

The gap between effort and reality is caused by the learning process and psychological state of the student. Astra *et al*., (2015) states that physics learning in schools is still using the approach of teacher centered learning. Conventional learning method with teacher centered learning approach makes the students grow into be irresponsible for their learning result in learning process (Rasouli & Nasimi, 2015).

One of the psychological states of students relating to learning achievement is self-efficacy. Bandura (in Roof, 2015) defines self-efficacy as a belief in the ability of individuals to be able to organize and carry out a series of businesses. Wiguna (2013) found that self-efficacy affects students' physics learning achievement. According to Multon (in Balami, 2015), self-efficacy is a strong predictor of learning achievement. Zimmerman *et al*. (In Balami, 2015) also states that self-efficacy has a positive effect on student achievement. Based on this, it can be concluded that when the learners' self-efficacy increases then the learning achievement will also increase and vice versa. Similarly, Pajares and Schunk (in Tehrani *et al*., 2014) point out that strong self-efficacy leads learners to the level of motivation, academic achievement and interest in higher education issues.

Based on the findings in the field, students of class XI MIPA SMA Negeri 3 Singaraja have low self-efficacy this is shown from the results of questionnaires where the average score obtained by students 47 low category. These results correspond to interviews of five students where they always assume that he is incapable of mastering the concepts of physics. This is shown from the statement of students who rely more on remedial activity rather than trying to do well in repetition. Most students admit that they rarely learn especially about material they do not like. Students are less fond of monotonous learning activities. This is evident from the results of students' replication, 78% of the average number of students in one class did not reach the value of KKM of 75. Lack of conceptual understanding causes students difficult to solve problems that require concept understanding, so the indicators in the static fluid material is not can be achieved with the maximum. This happens because the learning that occurs in the school is still conventional and in the learning activities of teachers only use the conventional student' handbook without any variation. In other hand,the students also werenot taught with learning strategies that make them interested, enthusiastic and self motivated.

To overcome the problems in physics learning on static fluid material, it is necessary to develop learning instruments with cooperative learning model of Group Investigation (GI) to improve students' self-efficacy and learning achievement. The development of physics learning instrumentswas done based on Group Investigation (GI) learning model combines with the principles of cooperative learning via constructivism-based learning and the principles of democratic learning. The unique character of group investigation (GI) exists in the integration of four basic features such

as investigation, interaction, interpretation, and intrinsic motivation (Sharan, 2009).

Static fluid materials that have abstract concept characteristics in several indicators and there are real problems in everyday life such as submarine use and use of hydraulic pumps when lifting a car, suitable to be applied with cooperative learning with group investigation (GI) model. In group investigation activities, students become investigators to investigate the concept of pressure and mass types as well as other concepts related to the topic of inquiry, conditioned students to interact with groups, associate static fluid materials with daily life problems, and train students' ability to own positive self-esteem. Using cooperative learning model of group investigation (GI) type in physics learning on static fluid material helps teachers in directing students to be actively involved in the learning process. Cooperative learning type group investigation (GI) is one of the most complex types of cooperative learning. Students are involved in planning both the topics being studied and how the student's inquiry proceeds.

Based on the considerations, the researcher feels need to conduct research entitled of "Development of Physics Teaching Instruments Belong to Cooperative Group Investigation Modelto Improve Students' Self-Efficacy and Learning Achievement".

METHOD

This research includes development research that is developing physics teachinginstruments with cooperative learning model type group investigation (GI) to improve self-efficacy and student achievement. The products developed in this study are learning tools to improve students' self-efficacy and achievement which include: (1) Lesson plan (RPP), (2) Student handbook (BAS), (3) Student worksheet (LKS), (4) Learning Achievement Test, and (5) Self-Efficacy Questionnaire.

Subject in this research is physics teaching instruments for the topic ofstatic fluid which tested for students in grade XI MIPA SMA Negeri 3 Singaraja. The sample comes from three different classes with a sample size of 75 students.

The research design is One Group Pretest-Posttest Design with three time replications. Before conducting the lesson, the pretest (U1) is conducted, and after performing cooperative learning group investigation (GI) L,the posttest (U2) is done.

The testing designcan be illustrated as follow (Prabowo, 2011):

$$U1 \rightarrow L \rightarrow U2$$

where:

U1 : the pretest
U2 : the postest
L : learning and teaching via cooperative learning group investigation.

Data collection technique

The study used three data collection techniques that are observation, test, giving questionnaire and questionnaire.

Data analysis technique

The data analysis in the experiment is done by using quantitative descriptive analysis to describe the data as it is in percentage form and explain the data or the incident with qualitative explanation sentences which include:

1) *Learning Device Validity Analysis*
   Data analysis of device validity is done by averaging each score obtained from every aspect assessed by the validator. The average score of each aspect is then categorized based on Ratumanan and Laurens (2011).
2) *Analysis of Readability of BAS and Student Worksheet*
   The validity data obtained was analyzed by quantitative descriptive. The result of data analysis of BAS and students worksheet legibility is elaborated with qualitative descriptive. The level of legibility is calculated by comparing the number of words correctly filled with the total number of words that should be filled 100% times.
3) *Analysis of the Implementation of Learning*
   Observation of the implementation of the lesson plan conducted by two observers by giving a check mark (√) in the column of implementation and assessment column. Description of the implementation of the lesson plan is determined by comparing the results obtained with the lesson plan implementation criteria based on Wicaksono in Mardewati (2016)
4) *Student Activity Analysis*
   Observation of student activity is done on every teaching activity by two trained observers so that they can mengoprasikan sheets properly. Observation is done every 2 minutes during teaching activity by giving check mark (√) on every activity that happened. Percentage of result observation analysis of student activity then converted menggunkan category Riduan (2010).
5) *Obstacles analysis ofteaching activity*
   The analysis of the obstacles during the learning implementation is analyzed descriptively by collecting, discussing and evaluating the suggestions given by the observer to the learning activities that have been done.
6) *Analysis of Student Learning Achievement*
   The result of student achievement is obtained by using test method. Assessment of student

achievement only in the kogmitif domain. The cognitive aspect in SMAN 3 Singaraja is said to be complete if it meets the minimal criterion standard that is 75. The influence of learning on student's learning achievement is measured using normalized gain analysis adapted from Hake normalized gain formula (1999).

$$< g >= \frac{\langle S_{post} \rangle - \langle S_{pre} \rangle}{100 - \langle S_{pre} \rangle} \quad (1)$$

where:

<g> = Peningkatanhasilbelajar (rata-rata *normalized gain*)

$<S_{pre}>$ = Rata-rata nilai*pretest*

$<S_{post}>$ = Rata-rata nilai*posttest*

7) *Student Self-Efficacy Analysis*

The result of self-efficacy assessment of students was obtained by using questionnaire. Self-efficacy assessment is only in each dimension. Achievement score of each dimension in the range 69-100 with high category. The effect of learning on student achievement was measured using normalized gain analysis adapted from the formula normalized gain Hake (1999).

8) *Analysis of Student Responses*

Questionnaire responses are used to view students' opinions about the learning model taught to improve self-efficacy and learning achievement. Student responses were analyzed descriptively with the percentage adapted from Aries (2011).

9) *Statistical Analysis*

a. Normality test

Normality test aims to know that the sample data obtained normal or abnormal distributed. Normality test is done on pretest data with assumption that before given equal treatment in each class XI MIPA-1, class XI MIPA-2, and class XI MIPA-3 first seen the normalized data. If the normal test results show the data of each class is normally distributed, then the same treatment can be given in each class XI MIPA-1, class XI MIPA-2, and class XI MIPA-3. Normal data can be determined by using some statistical tests, but in this study only use Shapiro-Wilk test with significance level α = 0.05 (2-tailed). Hypothesis form for normality test according to Sugiyono (2014) are:

H_0 : data comes from normally distributed populations.

H_1 : data comes from a population not normally distributed.

If Sig $<\alpha$, then H_0 is rejected.

If Sig $>\alpha$, then H_0 is accepted.

b. Homogeneity Test

Homogeneity testing is a test to see the equality between one sample and another sample in one population. Homogeneity test used in this research is Levene test with significance level α = 0.05 (2-tailed) hypothesis testing according to Sugiyono (2014) are:

H_0 : data comes from the same population variance.

H_1 : the data comes from an unequal population variance.

If Sig. $<\alpha$, then H_0 is rejected

If Sig. $>\alpha$, then H_0 is accepted.

c. The *t*-Test

The *t*-test used in this study is a paired *t*-test (Paired Samples *t*-Test) to compare two paired samples. Paired samples are defined as a sample of the same subject, but subject to different treatment. For example, class XI MIPA-1 before treatment is given pretest (pretest result of student as data before treatment) and after posttest treatment given (posttest result of student as data after treatment), so also for class XI MIPA-2 and class XI MIPA-3 . Doing a paired t-test should meet some of the assumption prerequisites that the sample data is normally distributed and the sample data is homogeneous. The paired *t*-test uses *n*-1 free degrees, where *n* is the sample number and significance level α = 0.05 (2-tailed). The hypothesis for *t*-test according to Sugiyono (2014) is:

H_0 : The average pretest and posttest results are no different.

H_1 : The average pretest and posttest results are different.

If Sig>α, then H_0 is accepted.

If Sig <α, then H_0 is rejected.

RESULT AND DISCUSSION

Learning Device Validity

The validity of instructional tools is a way to gain suggestions as a basis for revising learning tools that have been developed. The results of validity in the form of consideration of experts and practitioners regarding lesson plan, BAS, students worksheet, Learning Achievement Test and Self-Efficacy Questionnaire.

The development of physics teaching instruments with cooperative learning model group investigation is valid if it fulfills the minimum validity score of 2.6 (Ratumanan& Lauren, 2011) to improve self-efficacy and learning achievement. Learning device development outcomes include lesson plan, BAS, student worksheet, achievement test, and self-efficacy questionnaire can be seen in Figure 1.

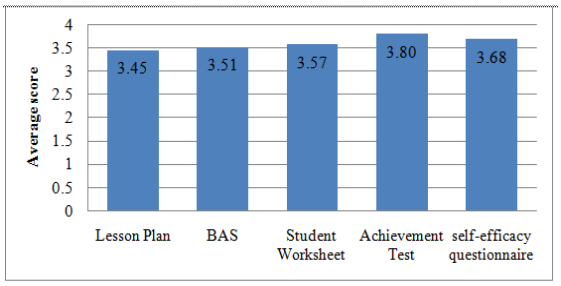

Figure 1. Validity of the instruments.

The achievement of the valid category in the development of teaching instruments because the development of the instrument has been through several stages of needs analysis, student characteristics analysis, concept analysis, task analysis, discussion with high school physics teacher, supervisor study, and input both validators so that the teaching intruments that have been developed can be used in learning physics to develop self-efficacy and student achievement.

Stages of learning development pay attention to the characteristics of the model used. The researcher uses a model of learning device development according to Kemp (1994) covering problems in learning, analysis of the characteristics of learners, task analysis, formulating learning objectives, learning strategies, choosing instructional media, selection of supporting services, preparation of evaluation instruments, and learning device validation. Development of learning tools that researchers develop include leasson plan, BAS, student worksheet, and evaluation instruments that are learning achievement test and self-efficacy questionnaire. The development of learning tools developed by researchers has been validated by some validators who are competent in the field of physics education and have been declared invalid so that learning tools developed can be used for research.

Practicality of Learning Devices

The practicality of instructional tools can be obtained from the results of the legibility of learning tools, the results of the implementation of RPP, the results of student activities and obstacles faced.

1) *Level of Readability of intruments*

The legibility of BAS and students worksheet is the level of students' ability to read BAS and student worksheet through a test of filling in certain words that are omitted mathematically. Assessment of the legibility of BAS and student worksheet was represented by five students of all students sampled. BAS and student worksheet legibility levels are at least categorized as materials appropriate for learning with percentages in the 40-100 range. The results of BAS and student worksheet readability assessment are summarized in Figure 2.

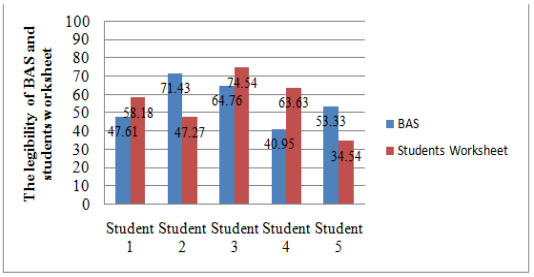

Figure 2. The readability of the instruments.

The results of the assessment of student handbook readability (BAS) were tested on five students. Figure 2 shows that the average percentage of readability level of BAS is 55.62%, so BAS includes the right material for learning and the average percentage of student worksheet 55.63% legibility level, so the student worksheet is the right material for learning. These results indicate that BAS and student worksheet developed are prepared with the right material. According Mulyasa (2006) learning tool is a means to streamline the learning process in accordance with what has been planned.

2) *Implementation of lesson plan*

Assessment of the implementation of the stages contained in the lesson plan is done during the learning process by two observers who are physics teachers at SMAN 3 Singaraja. Criteria of the stages in question is the quality of the implementation of stages with a score of 1-4. The results of lesson plan implementation can be seen in Figure 3, Figure 4, and Figure 5.

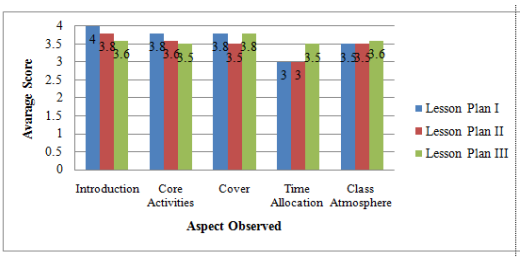

Figure 3. The implementation of lesson plan in class XI MIPA-1.

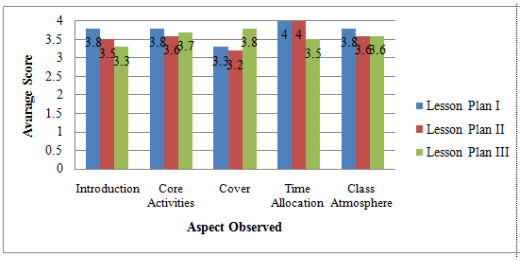

Figure 4. The implementation of lesson plan in class XI MIPA-2.

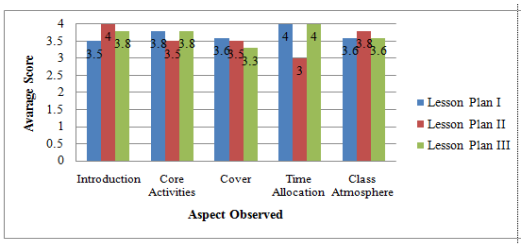

Figure 5. The implementation of lesson plan in class XI MIPA-3.

The implementation of lesson plan is divided into teaching activity observations, time allocation and classroom atmosphere. The average score on the implementation of lesson plan in replication I, replication II and replication III is presented in Figure 3; Figure 4; and Figure 5. The average score obtained shows that overall lesson plan is very well done.

The results of learning activities on the introduction, core activities, cover, time allocation and average class atmosphere is good. Activities provide apperception and motivation, convey the purpose of learning / indicators and organize students into the average group very well. The core activities during the average teaching activity performed very well. The activities provide conclusions, evaluate teaching activity and close the learning with the assignment as follow-up learning averages performed very well. The time allocation during the average teaching activity performed very well and the classroom atmosphere during the average teaching activity performed very well. This shows that teachers are able to manage the learning well, allocate time well and the teacher is able to create a class atmosphere that is kundusif so as to attract the attention of students in conducting investigative activities. This is in accordance with Ulfa and Sugianto (2015) research, the results of the study show that the group investigation model makes the inquiri community students which means that each student becomes the investigator for the learning interest in the class, thus contributing greatly to the success of the learning process in the classroom.

3) *Student Activities*

Student activities observed in each lesson plan consist of paying attention to teacher explanations, answering questions given by teachers, joining groups, picking and choosing topics, doing group learning, conducting experiments and group investigations, collecting data, analyzing data, group discussions, preparing final reports, finalizing the final report, making feedback, drawing conclusions, working on exercise questions and irrelevant behaviors. The average score of student activity on replication I, replication II and replication III is 20 with the average percentage of student activity reaching 100%. The average reliability of student activity observation on replication I, replication II and replication III was 92%

The result of observation of student activity obtained shows that the students play an active role in learning with cooperative learning model group investigation. This is supported by the research of Dharwadkar *et al*. (2015), the results of his research indicate that the group investigation learning model occupies a significant place in education. The learning process with group investigation learning model gives optimal results and contribution to the learning achievement, because the students are directly involved in the learning process. Meanwhile Slavin and Kagan (in Santyasa, 2011) stated that cooperative learning is one of the group investigations not only better in the acquisition and retention of lesson content, but also advancing interpersonal skills. So it can be concluded that cooperative learning type group investigation can improve student learning activities.

4) *Obstacles During KBM*

The obstacles faced during the teaching and learning activities are the students as the subjects of the trial did not attend on time according to the agreed schedule, many students were outside the classroom so that the teaching and learning activities were carried out after all the participants were present. In a question and answer session, students tend to rush to ask questions that disrupt the discussion so that teachers restrict students who ask questions by giving the opportunity to ask for representation of each group. There are still students who do not pay attention to the practice manuals in the student worksheet so that students use improperly functional experimental tools so the teacher should control the students' performance during the lab.

Practicum activities for static fluid material is new for students of grade XI MIPA SMA Negeri 3 Singaraja so it is very necessary to facilitate practicum activities with teachers facilitate practicum activities by providing simple tools that can be found everyday. Insufficient availability of laboratory tools in the laboratory so teachers are innovating to make simple practical tools.

To overcome the obstacles encountered during teaching and learning activities, researchers have evaluated subsequent learning by learning after all students are present in the classroom, limiting questioning students by providing opportunities to ask for representation of each group, controlling student performance during investigation activities, facilitating investigative activities are not only in the laboratory but can be done by providing simple tools that can help the investigative activities and researchers innovate to create simple pratikum tools for investigative activity. Overall obstacles during teaching and learning can be overcome.

Effectiveness of Learning Devices

The effectiveness of instructional tools can be gained from improved learning achievements, self-efficacy and student responses.

1) *Learning Achievement*

The result of pretest and posttest of student achievement is analyzed by qualitative descriptive analysis by calculating the average of pretest value and posttest value, then the mean pretest and posttest values are used to calculate the normalized N-gain score. Normalized N-gain scores are used to determine the learning achievement categories of students between before and after learning using cooperative learning model of group investigation type.

The average score of N-gain obtained by class XI MIPA-1 is 0.79 with high category. The average score of N-gain class XI MIPA-2 was 0.72 with high category. While the average score of N-gain class XI MIPA-3 is 0.68 with medium category. All three classes have N-gain score with medium to high category. Results of achievement learn per indicator can be seen in Figure 6.

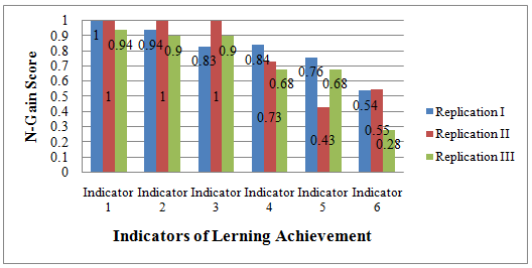

Figure 6. N-gain score of students achievement.

Average N-gain indicators of learning achievement in the learning process with cooperative learning model type group investigation categorized high. The results of the analysis of the completeness of the indicators on replication I show that the indicators of learning achievement in pretest has not been achieved, because the percentage of the completeness of indicators is still below 75%. The result of pre-test student achievement has not been achieved, completeness of student achievement indicator 0%. Learning with cooperative learning model type of group investigation after implementation, post-test results showed that 5 indicators of learning achievement greater than 75% or overall completeness of all indicators by 90% with an average gain of 0.82 with category high. The results of the analysis of the completeness of indicators on replication II indicate that the indicators of learning achievement in the pre-test has not been achieved, because the percentage of the completeness of indicators is still below 75%. The result of pre-test student achievement has not been achieved, completeness of student achievement indicator 0%. Learning with cooperative learning model type of group investigation after implementation, post-test results showed that 4 indicators of learning achievement greater than 75% or overall completeness of all indicators by 86% with an average gain of 0.79 with category high. The results of the analysis of the indicator completeness on replication III indicate that the indicator of learning achievement in pre-test has not been achieved, because the percentage of the indicator is still below 75%. The result of pre-test student achievement has not been achieved, completeness of student achievement indicator 0%. Learning with cooperative learning model type of group investigation after implementation, posttest result shows that 5 indicator test of learning achievement is greater than 75% or the average completeness of all indicator equal to 85%. with an average gain value of 0.73 with high category.

In replication I, replication II, and replication III indicators of learning achievement make judgments about the various materials and methods in item 14 and 15 are incomplete. In replication II the indicators of learning achievement combine the various rules and principles of the material for the new form in items 12 and 13 are not complete. Problems 12 and 13, the form of questions presented with the C5 cognitive domain that requires students to connect or rearrange specific things in order to develop a new structure. Problems 14 and 15, the form of questions presented with the C6's cognitive domain that requires students to apply the knowledge and capabilities they have to assess a proposed case so that the student can choose problem-solving on the given problem, from the choice of choice given by the decision-making and understanding of students, so that students must really have the right decisions and understanding of the given problem. Through teaching and learning activities with cooperative learning model type group investigation train students to cultivate the ability of independent thinking. In addition, this model requires students to have good communication skills as well as group process skills. Active student engagement can be seen from the first stage to the end of the lesson will give students an opportunity to further refine the idea and the teacher will know the possible wrong ideas of the students so that the teacher can correct the mistakes. This is in accordance with the research of Martinez and Diana, (2015) which shows that the learning process will take place optimally and meaningfully when the students have prepared themselves in advance with attention to the planning that has been designed by the previous teacher.

Normality test results using Shapiro-Wilk test as shown in Table 1.

Table 1. Result of normality test.

Sample	α	Sig.	Hint.
XI-1	0.05	0.407	Normal
XI-2	0.05	0.069	Normal
XI-3	0.05	0.076	Normal

Based on hypothesis testing the data come from normally distributed population. It means that the condition of the sample taken is similar to the actual population.Homogeneity test results using Levene test as shown in Table 2.

Table2. Result of homogenity test.

Sample	α	Sig.	Hint.
XI-1	0.05	0.756	Homogeny
XI-2	0.05	0.718	Homogeny
XI-3	0.05	0.554	Homogeny

Based on hypothesis testing, the data comes from homogenous population variance. It shows that all students have the same knowledge ability at the beginning of learning.

The result of paired *t*-test as shown in Table 3.

Table3. Result of *t*-test.

Sample	*t*	*df*	α	Sig.
XI-1	-36.800	24	0.05	0.000
XI-2	-35.203	24	0.05	0.000
XI-3	-32.270	24	0.05	0.000

Based on hypothesis testing, pretest data before being given learning treatment and posttest data after given learning treatment is known that the treatment of learning with cooperative learning model of group investigation has significant influence in train students science process skill.

Self-Efficacy

The results of the analysis of each dimension of self-efficacy based on the results of questionnaires obtained average scores on the third replication is 42 at the level dimension, 41 on the dimensions of generality and 45 on the strength dimension with low category. The learning with cooperative learning model of group investigation after implementation, the average score on the three replications was 84 at the level dimension, 86 on the dimensions of generality and 82 in the strength dimension. The categories are very high on the dimensions of generality and with high categories on the dimensions of the level and on the strength dimensions. In the level dimension students are able to overcome the difficulty of the task given during teaching activity. In the dimension of generality students are faced with complex situations have a strong confidence in solving problems encountered and able to maintain its analytic efficiency. In the dimension of strength students are able to maintain their ductility in solving problems given during teaching activity. The existence of high N-gain category can be said that the high self-efficacy of students occurs because the cognitive process where self-efficacy of individuals will affect the mindset that is helpful of self-efficacy the higher it will affect the determination of the higher goals also with a commitment to achievement , students with high self-efficacy will have a demonstrated success picture of postive and effective appearance and behavior and self-efficacy affecting cognitive function, such as information experience process. Where a person who has a strong belief in the memory capacity of his brain, the stronger the effort made to process the cognitive and improve the ability of the individual memory.

Bandura, (2001) in cognitive social theory states that self-efficacy can help one in determining the choices, the effort to advance, the persistence, and the perseverance they demonstrate in the face of adversity and the degree of anxiety or tranquility they experience as they sustain tasks related to their lives. This is supported by the research conducted by Anita *et al*., (2013). The results show that self-efficacy has improved in the GI learning model because in the GI learning model there is Inkuiri element. Inquiry is a way of studying or examining something that is critically seeking, analytically argumentative by using certain steps toward a convincing conclusion. The results of this study are in line with research conducted by Jamaldini *et al*., (2015) which shows that the factors of self-efficacy, self-concept, and student learning strategies do directly or indirectly affect student achievement. If the teacher creates the right learning environment, then this can increase these factors. This study states that self-efficacy can affect student achievement. This means that students with low self-efficacy imply low learning achievement, and vice versa. Therefore, teachers need to choose the right learning model so that the students self-efficacy can be improved so that it leads to a more optimal learning achievement.

Student's Response

Student's response to the material, BAS, student worksheet, learning atmosphere and how the teacher taught 87% was interested and 90% felt new to the component. The response indicates that the component of learning device with cooperative learning model of group investigation which developed is interesting and relatively new for the students.

Student responses to the language in the material, BAS, student worksheet, learning atmosphere and the way the teacher taught 85% found it easy to understand, 90% felt interested. Thus the learning tools developed can facilitate teachers in improving student self-efficacy and achievement.

The student's response to an increase in self-efficacy was 92%. This shows that the percentage increase of student self-efficacy is high. The student's response to the ease of responding to the item is 93%, indicating that the student can solve the problems well.

The results showed that the students responded positively to the learning with cooperative learning model type of group investigation with very good category, so it can be concluded that the learning tools developed can help teachers improve self-efficacy and student achievement. This is supported by research conducted by Martinez and Diana, (2015) the results of his research indicate that the positive response shows the art of teachers in teaching that includes readiness instruction lesson plans and instruction manuals, the role of educator authority, and motivation and awards to students' early knowledge can improve students' learning motivation of class management and readiness to accept lessons in the classroom and good interpersonal relationships between teachers and students.

CONCLUSION

The developed physics teaching instruments meets the criteria of validity, practicality and effectiveness so that it is feasible to be used to increase student's

self-efficacy and learning achievement on static fluid.

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