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THE APPLICATION OF INQUIRY LEARNING MODEL TO IMPROVE "SATU ATAP" STUDENTS' LEARNING RESULTS AT SMPN 4 SINGOSARI MALANG

B. Setiawan*[1], T. Sunarti[2], D. Astriani[3]

[1,3] Prodi S-1 Pendidikan IPA Unesa, [2]Jurusan Fisika Unesa
Fakultas Matematika dan Ilmu Pengetahuan Alam Unesa, Surabaya, Indonesia

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ABSTRACT

The implementation of the learning device with inquiry learning model into a developed model and tested in the learning process in elementary and junior high school "Satu Atap" 4 Singosari Malang. This type of research is done through experimentation with pre-experimental design that is implemented by the design of one group pretest and posttest design. The trial results with the learning device guided by inquiry learning model at the elementary-SMPN 4 "Satu Atap" Singosari Malang shows that the activities carried out as many as four meetings run according to the lesson plans have been made. Learning by using inquiry model on electric material can be accomplished through: 1. Identification of question / formulate problem with the average score 3:38 (pretty good), step 2. Formulate a hypothesis with an average score of 3:25 (pretty good), step 3. Designing and observation/ experiment with an average score of 3:50 (well), step 4. Collecting and analyzing the data with an average score of 3:38 (pretty good), and step 5. Drawing conclusions/ generalizations with an average score of 3:38 (pretty good). Learning models for additives substance material with step 1. Identify the question / formulate the problem got an average score of 3:13 (pretty good), step 2. Formulate a hypothesis to get an average score 3:13 (pretty good), step 3. Designing and making observations / experiment with an average score of 3:38 (pretty good), step 4. Collecting and analyzing the data with an average score of 3:25 (pretty good), and step 5. Drawing conclusions / generalizations with an average score of 3:50 (well). The students' learning outcomes using inquiry learning model covers aspects of knowledge, skills and attitudes obtained as follows: the aspect of knowledge through the pretest and posttest on the matter of electricity has increased the average percentage score from 42.6 on the pretest become 67.7 with an average score of N-Gain 0.44 in the medium category, while the knowledge aspect of learning outcomes on additive substance material has increased the average percentage of the score from 42.6 to 82.2 in pretest and posttest with an average score of N-Gain 0.69 in the medium category. The skill aspects on electricity material get the highest score in the predicate B +, while the highest score of additive substance material on the predicate A-, as well as attitudes aspects shows that more than 50% students show a good attitude during the learning process, ie 67% on the electricity material and 80% on the additives substance material.

Keywords: Inquiry Learning Model, Science Learning Media, Students' Learning Outcomes

INTRODUCTION

"Satu Atap" Elementary School - Junior High School (SD-SMP) is a different educational model of elementary and junior high schools because the implementation of teaching and learning process is in one place. This model is designed for educational institutions become closer to the most easily accessible by the society (Fadjri, 2009). We hope no longer school-age children who are not in school because of the distance to school. However, the quality of the education in

***Alamat korespondensi:**
Email: benisetiawan@unesa.ac.id

"satu atap" elementary and junior is still far from ideal, as happened in the SMPN "Satu Ata"" Karangploso Batu-Malang and SD-SMP "Satu Atap" Kokop Bangkalan village, none of the students is graduated in National Examination 2010. It shows that all subjects tested in National Examination including IPA, the students obtain low score or below the standard set by the government. One of the failure reason is the limitation of the human resources quality. This is consistent with the research results of Rahmasari, 2014 stating that the limiting factor in the implementation of elementary and junior high chool of "SATAP" is the number of teachers and education personnel are not adequate. In contrast to ordinary schools whose human resources are met in terms of both the amount and the minimum requirements, the student background, school facilities as well as the location and distance are relatively easy to reach. Therefore, we need a breakthrough in the process of learning science in "Satu Atap" elementary and junior high school in preparing the plan of learning process by the teacher. The empowerment of the teachers in "SATAP" elementary and junior high school should be done to overcome the obstacles in the implementation of schools' policies in the learning process (Rahmasari, 2014). In addition, the need to pay our attention to the lack of facilities in the school, for example, no media such as OHP, no internet facility and have not apply the inquirí learning model in the science subject in "Satu Atap" elementary and junior high school.

The inhibiting factor of the activities implementation in "SATAP" elementary and junior high school in addition to the lacking number of teachers and education personnel, inadequate facilities and infrastructure is also inadequate (Rahmasari, 2014). Muhafid, 2013 stated that one of the causes of have no science learning at "SATAP" schools because the teachers are from different disciplines and the limited learning device, media, and science learning resources for teachers and students.

Data from observations mention that the use of media-based IPA both manual and IT will greatly assist the process of students' concept understanding and can support student achievement (Science learning media especially about abstract concepts). From an interview with some teacher who teach at "SATAP" school, it revealed the problems arising from the teachers in the implementation process of learning science, namely the lack of facilities and infrastructure of the school. Another thing that is more important is to prepare the teachers in preparing a learning device and the media that support and implement the inquiry learning tools in the learning process that can improve students' skills in scientific processes that can improve student learning outcomes. According to Lee &Krapfl, 2002; Smolleck et al., 2006 in Nam (2011), Inquiry-based learning provides opportunities for students to internalize or transform the new information by which they construct their individual cognitive structures.

Results of other studies mention that the media model of DNA proved to be effective in teaching the concept of genetic material (Susantini, 2008). The same was reported, that the use of models of DNA, photographs and chromosome preparation can finish high school student learning objectives (Vebriari, 2010).

Science media and learning tools that will be developed need to pay attention to hands-on and minds on that needs to be equipped with the Student Activity Sheet (LKS) which can stimulate students' inquiry skills "Satu Atap" elementary and junior high school. The students will spend a lot of time in inquirí activities such as: observing, manipulating materials, and conduct an investigation. The learning objectives can be achieved if the inquiry involves students in identifying the problem, make hypotheses, predict the concepts and principles, designing experiments, discussion, analysis, and concluded.

"Problem solving therefore, a variety of instructional strategies should be included in one's teaching repertoire. To achieve the goal of science instruction based on open-inquiry, instruction should involve students in hypotheses testing (testing the predictions of concepts or principles) or problem solving (testing the solutions to problems). Open- inquiry instruction, such as problem solving or hypotheses testing, provides students" (Pizzini, 1991).

Science in an inquiry process is already listed in the Content Standards. The fact that happened in elementary and junior high school "Satu Atap" has minimum facilities, so inquiry skills are rarely trained. The problems which experienced by the teachers when teaching science with inquiry are the lack of media and the application to the learning process. According to Christina et al., 2006 states that a science teacher who first used the inquiry often fail in the learning process because teachers have not been able to understand the use of inquiry in the science learning.

Inquiry learning model is a model of learning which the student formulates the problem, designing experiments, collecting, analyzing data and make decisions all by themselves and must meet four criteria: clarity, appropriateness, accuracy, and complexity (Nugroho, 2012). Inquiry learning model is a type of learning that requires

the students to process the message so they obtain the knowledge, skills, and values. In addition, the inquiry learning model is a series of activities that highlight the process of critical thinking and analysis to seek and find their own answer to the problem in question through 1) orientation, 2) formulate problems, 3) formulate hypotheses, 4) collect data, 5) test the hypothesis, 6) formulate conclusions (Rahayu, 2013). Inquiry learning model can develop a scientific thinking skill by placing students as learners to solve problems and acquire the knowledge of critical thinking so they can understand the concepts of science (Kurniawati, 2014).

Therefore, a research about the application of inquiry learning model with multiple science media to improve students' learning score through the worksheet needs to be done. Inquiry skills that are given to students including: formulating the problem, formulating hypotheses, designing and conducting experiments, and formulate conclusions or generalizations.

METHOD

The type of research used is experimental with pre-experimental design. The implementation scenarios are implemented through the design of one group pretest and Posttest Design (Dawson, 1997).

RESULTS AND DISCUSSIONS

The application result of the learning with inquiry learning model at the elementary-school SMPN 4 "SATAP" Singosari Malang regency consists of inquiry learning, the learning outcomes which consists of aspects of knowledge, skills and attitudes to learning.

Inquiry Learning

Inquiry learning in the electrical materials in class VI shows that the activities carried out as many as four meetings run according to RPP that have been made. At the activities core seen that the skills of inquiry, namely: 1. Identify the question / formulate the problem got an average score 3:38 (pretty good), step 2. Formulate a hypothesis to get an average score 3:25 (pretty good), step 3. Designing and making observations / experiment with an average score of 3:50 (well), step 4. Collecting and analyzing the data with an average score of 3:38 (pretty good), and step 5. Drawing conclusions / generalizations with an average score of 3:38 (pretty good). Learning outcomes in the form of a diagram is shown in Figure 1 below.

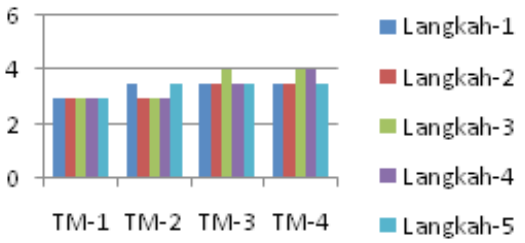

Figure1. The Results of Inquiry Learning In Electrical Material

Based on the above chart, inquiry learning outcomes categorized quite good to excellent from step 1 to step 5. Corebima (2010) state that inquiry-based learning is a teaching strategy that has the potential to empower the ability to think. Some research also suggests that the inquiry-based research supported by media will enhance the skills and student learning outcomes, while the guided inquiry learning outcomes in the additive material shows that the activities carried out as many as four meetings run according to RPP that have been made. Consider the following two pictures.

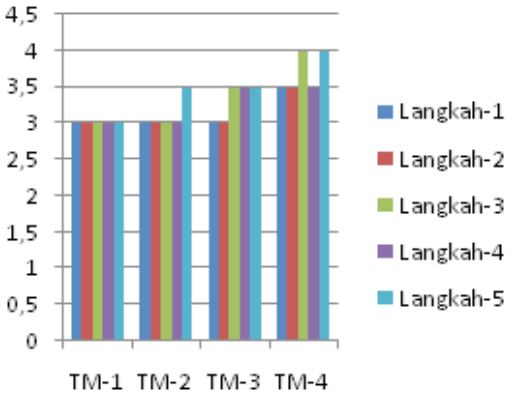

Figure 2. The Results of Inquiry Learning about additives Materials

Based on the above chart, inquiry learning outcomes have good enough category from step 1 to step 5. The results of guided inquiry learning on material additives in class VIII indicates that the activities carried out as many as four meetings run according to RPP has been made, at its core activities appears that the skills of inquiry that is step 1. Identify the question / formulate the problems obtaining an average score of 3:13 with the category quite well, step 2. Formulate a hypothesis obtained an average score of 3:13 by category quite well, step 3. Design and conduct observation / experiment with an average score of 3:38 categorized quite good, step 4. Collecting

and analyzing the data with an average score of 3:25 categorized quite good, and step 5. Drawing conclusions / generalizations with an average score of 3:50 categorized good.

Inquiry learning model in the matter of electricity and additives runs very effectively conducted on students from elementary and junior high school "SATAP", this is according to research from the Muslim (2011) which states that the results of inquiry learning in the material expansion goes very well with an average percentage of 95% , as well as according to Setiawan (2013) states that the learning process by using inquiry model can improve students' activities by 77.34% compared with 69.98% for conventional learning. It indicates that the inquiry learning model is suitable in science learning through the identification question / formulate the problem, formulate hypotheses, design and conduct observation / experiment, collecting and analyzing data, and draw conclusions / generalizations. Inquiry learning model can also help to improve the ability of students' science thinking process (Simsek, 2010).

Learning Outcomes

The learning result in electrical materials and additives include knowledge, skills and motorics through technical pretest and posttest. The study results can be seen in Figure 3.

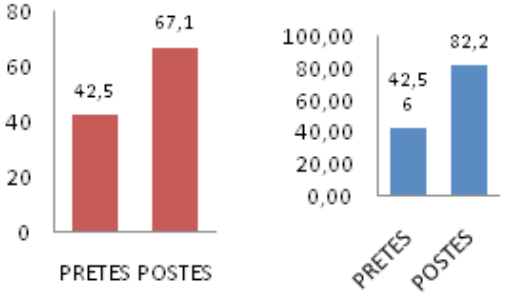

Figure 3a. Learning Outcomes of Electrical Materials Knowledge of, **Figure 3b.** Learning Outcomes of Material Additive Knowledge

Based on the picture above, the learning outcomes aspects of electrical materials knowledge has increased on the average value from 42.6 into 67.7 with an average value of N-Gain score of 0.44 in the medium category, while the knowledge aspect of additive materials has increased the average value on the posttest from 42.6 to 82.2 with an average value of N-Gain score of 0.69 which is categorized as medium. This is supported by the research results by Maretasari (2012) which states that the inquiry learning model can improve learning outcomes by 0,53 of the N-Gain and categorized well so can be concluded that the inquiry learning model has a significant impact on student learning outcomes. Other studies have shown that by using inquiry learning model, it has positive influence on the understanding of the concept as evidenced by the results of the students score an average of 9:50 to 18:55 (SimsekKabapinar P & F, 2010). Similar statement by Kurniawan, 2013 that the inquiry method can improve students' understanding of concepts and creativity of the students with the data in the form of classical values student achievement in the first cycle of 78.04% to 97.56% in the second cycle. Inquiry based learning approach that has a positive impact on student learning, because students are invited to work like scientists, given the experiences, making it easier for students understanding the material and the impact on the students' score is seen on the graph post-test.

Inquiry based learning is effective to increase the learning outcomes, the student enthusiasm in participating the practical activities, and the attitudes of students in learning. Based on the score of N-Gain acquired with category shows that the learning outcomes aspects of knowledge does not give much effect to the improvement from pretest to posttest, it is because the students from elementary and junior high school "SATU ATAP" 4 Singosari Malang are not familiar with the activities such as identified question / formulate the problem, formulate hypotheses, designing and observation / experiment, collecting and analyzing data, as well as draw conclusions / generalizations. Therefore we need the implementation of inquiry learning model on an ongoing basis, while the learning outcomes on electrical materials and additives substance using inquiry learning model can be seen in Figure 4.

Figure 4a and 4b show the ability of students to the skill aspect. In electrical material, the highest value on the predicate B +, while the highest value on additive material on predicate A-. This shows that there is a skill that have not mastered by students which is stringing a simple electrical tools, while at the material additives students can do better at the activities designed in LKS, so the results indicated that the students' skills in material additives is higher than the material electricity. The above results is in consequence to research from Jayadianta (2010) which states that the inquiry learning model can develop the ability of students' skills such as drafting tool skills by 65.62%, the skill to make charts trial in accordance with the guidelines of students' work-

sheet 46.87% and skills to determine solid objects by 100%, while the learning attitude in electrical materials and additives using inquiry learning model can be seen in Figure 5.

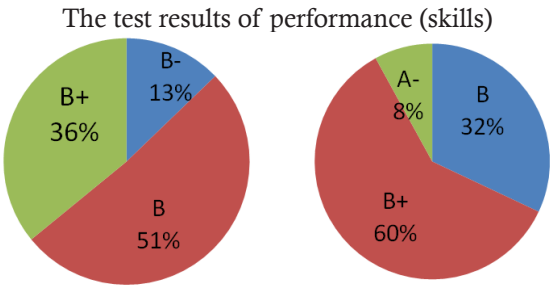

Figure 4a. The graph of students' skills learning outcomes of electrical material, 4b. The graph of students' skills learning outcomes of Additive material

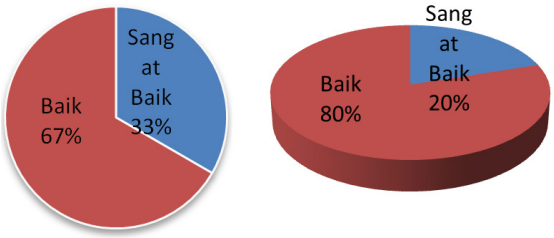

Figure 5a. Graph of discipline attitude in electrical materials, 5b.Grafik discipline attitude in material additives.

Based on the chart above shows that over 50% of the student's attitude is good, ie 67% of electricity and 80% of the material in the material additives. The management attitude in elementary and junior high school, students' attitudes need to be developed so that can be better. This is in accordance with the psychological stages of students aged 12-14 years who are at times search of self recognition. According to Jayadianta (2010) states that the inquiry learning model can develop the ability of students' attitudes as it expresses the opinion of 71.87% and 65.63% of experimental work. Activities in inquiry learning can influence a positive attitude in learning science (Bayram, 2013).

CONCLUSION

Based on the analysis and discussions, the following conclusions can be made, A. the process of learning by using Inquiry Learning model on electric material with step 1. Identify the question / formulate problem with an average score of 3.00 observations categorized quite good, step 2. Formulate hypothesis with an average score of 3.20 categorized quite good, step 3. Designing and observation / experiment with an average score of 3.60 categorized good, step 4. Collecting and analyzing the data with an average score of 3.70 categorized good and step 5. Drawing conclusions / generalizations.

For additives substance material using step 1. Identify the question / formulate the problem, step by an average score of 3.00 is quite good category 2. Formulate a hypothesis with an average score of 3.10 categorized as quite good, step 3. Designing and making observations / trial, a step with an average score of 3.30, consider as good enough category 4. Collecting and analyzing the data with an average score of 3.70 categorized as good., and step 5. Drawing conclusions / generalizations.

The students' learning outcomes using inquiry learning model covers aspects of knowledge, skills and attitudes, obtained as follows: the aspect of knowledge through the activities of pre-test and post-test on the material of electricity has increased the average percentage of the score from 42.6 to 67.7 with an average score of N-Gain Score 0.44 categorized as medium, while the knowledge aspect of learning outcomes on additive materials have increased the average percentage score from 42.6 to 82.2 with an average value of N-Gain score of 0.69 is categorized medium. The skills aspects in electrical material got the highest score on the predicate B +, while the highest score on additive material on the predicate A-. The aspects of attitudes shows that more than 50% students show a better attitudes, 67% in electricity and 80% of the substance additives material.

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