

The Analysis Of Science Teacher Barriers In Implementing Of Science Process Skills (Sps) Teaching Approach At Junior High School And It's Solutions

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Abstract

Science Process Skills (SPS), are very important skill for students, not only in learning science, but also have a positive impact on the lives of students in the future. Therefore, science teachers should be able to design and implement teaching activities that stimulate the development of SPS students. Today, the teaching and learning process presents still less the opportunity to development of students SPS, so that the SPS students are still not optimal yet. This is presumably because science teachers are still has many difficulties in implementing of teaching and learning by SPS oriented. To that end, this qualitative research method aims to outline the difficulties faced by science teachers in implementing the teaching and learning by SPS oriented. The results showed that science teachers are still facing many difficulties in implementing teaching and learning by SPS oriented. Science teachers difficulties among other things are in; planning, developing SPS activity-oriented learning, making the instrument and to assess SPS. Based on these results the authors recommend that the government reinforce the training and guidance for science teachers and provide instructional materials that suitable SPS development to science teachers, so they will able to planning and assessing SPS directed and integrated.

Keywords: Analysis, Barriers, SPS-oriented learning, science teacher, Solutions

1. Introduction

Almost all countries in the world to making the science lessons as a compulsory subject in schools, ranging from elementary education, secondary, and even in college. Compulsory science as a compulsory subject in school is motivated by the urgency of the concepts, principles and laws contained in the science itself. According to Carin (1993) in school science learning goals is to "...Leading children to explore and describe the things that surround them ..." In more detail Prakash (2011), learning science in schools has several objectives, namely to; introduce students to the natural phenomena in their environment, introduces students to the outline of the principles of true scientific, ensuring that students understand the scientific method and to help students think properly about science in relation to other subjects, introduce students to the methods and systems of science and develop patterns of thinking, developing the character of students through the development of attitudes, habits of thinking, feeling, acting, curiosity, caution, curiosity which leads to a correct observation, and dare to admit that "I do not know"

Refers to the science of learning objectives as outlined above, it can be concluded that the learning outcomes creation science in schools is that students have the knowledge (facts, concepts, laws and principles) of science, scientific attitudes and skills. For those reasons, learning science should be designed in such a way that the knowledge, attitude and skills of science students develop together. In other words, the success or quality of science teaching and learning can be seen from the progress of science knowledge, attitudes and skills of students.

Variety of scientific skills that must be developed in science teaching and learning for example; skills in observation, measurement, data recording, data analysis, experimental design, communication and so on. Scientific skills are often referred to as the science process skills (SPS). It is based on the Rustaman, et al, opinions (2003) that skill or process involving Intellectual cognitive skills, and social manual. These skills are divided into two groups: basic SPS, include; observing, classifying, measuring, and predicting. The second group is the integrated SPS covering, ie; identifying and defining variables, collect and transform data, create data tables and graphs, describing the relationship between variables, interpret the data, manipulating materials,

recording the data, formulating hypotheses, designing investigations, make inferences and generalizations (Karamustafaoğlu: 2011).

During in this time, learning science at Junior high school more likely and dominant in developing students science knowledge, so that students scientific skills or SPS is neglected. Research shows that the SPS was instrumental in humans live, including student success. Rubin (1992) says that "...that people who are proficient in science process skills Scientists are not only better citizens but better... ". Then Ostlund (1992) also says that "... science process skills are the building blocks of thinking and inquiry in science ... ". The same thing also expressed by Rillero, Keil, Jodi Haney (2009), that is: "...Science process skills are not only important for those pursuing careers in science, but most jobs in this new millennium involve using these skills..." Therefore, the only give priority to scientific knowledge and ignore to the SPS is not perfect in science teaching and learning process, so it still needs to be improved and perfected. Improvements can be done by implementing learning science process skills approach.

According Rustaman et al (2003), teaching and learning by science process skills approach (SPS) is a teaching and learning oriented by science process. This teaching and learning process approach to demanding development process as a whole, namely the scientific method in every implementation, making it possible to develop science process skills (SPS) students in a focused, integrated and continuous. According to Harlen (1992), there are five aspects that must be considered by science teachers in developing students' SPS, namely, providing hands-on experience to the students to carry out exploration activities and material phenomena , provide an opportunity for students to conduct discussions, students listen to the conversation and check out product students, encourages students to review their activities and provide techniques or strategies to develop process skills.

Referring to the expert opinion on the above, it can be understood that in order to develop science process skills (SPS) students, the science teacher must be able to involve the SPS in planning, implementing and assessing learning undertaken. Involves learning plan; kind SPS anything that can be developed, determining SPS indicators, learning approach that allows the type of SPS assessment techniques developed and planned to be carried out. Implementing learning and vote in accordance with the plans that have been prepared.

During this time , the SPS -oriented science learning is still considered not optimal. This can be evidenced by the research that has been done by Sukarno, Permanasari, Hamida, (2013) which states that the science process skills of students at the junior high level is still much lower, as many as 43.48 % of the total 322 respondents . Thus it is necessary and very important to do serious research to find out what problems or difficulties in doing science teacher -oriented learning SPS? Therefore, this study aimed to determine the various difficulties faced by science teachers in implementing the SPS -oriented learning and to provide solutions to these problems. With the discovery of the difficulties in the implementation of SPS and learning -oriented solutions, it is expected to facilitate the task of science teachers in implementing the SPS -oriented learning science learning next.

2. Research Methods

This study used qualitative methods in order to obtain accurate data related difficulty learning science teachers in implementing SPS oriented. The data in this study were obtained through interviews involving 26 science teachers from 5 different junior high schools, so that science teachers who were interviewed at each sampled school there were 5 to 6 people. Interviews were conducted from August to September 2013 in Jambi.

To each respondent, has filed a variety of questions related to the problems faced by teachers in implementing the SPS -oriented learning. The questions focused on three main points, namely: learning plan (formulated type of SPS and the indicator in the learning and assessment techniques to be used, the selection of appropriate methods or approaches), the implementation of learning (implementation plan), assessment of student learning outcomes (SPS student assessment after learning).

To maintain the validity of the research data by doing triangulation. The triangulation was used are of methods and sources triangulation. Furthermore, for the data obtained easily understood, then the data were analyzed with descriptive analysis method. Thus in the discussion begins with the presentation of data findings are directly followed by the explanation. At the end of the description followed by the solution of every problem that has been discovered.

3. Data and Discussion

3.1. research data

This research is focused to find out the problems faced by science teachers in implementing the SPS-oriented learning. Therefore interviews with informants specifically related to the planning, implementation and assessment of SPS students. Research conducted in August-September 2013 in the Jambi has obtained the data in Table 1. Based on the distribution of the data in table 1, it can be seen that the junior high school science teacher at Edinburgh still has many barriers to learning-oriented science process skills (SPS). Various barriers were analyzed sequentially, starting from planning, implementation to the assessment of learning SPS students.

3.2. Discussion

a. Lesson plan

Planning is a very important first step in a learning activity. Good planning will also bring a good impact on the learning process, and vice versa. In conjunction with the science learning process-oriented skills, the plan also has a very important role. This includes planning, determination of SPS that will be taught to students, determine the skills attainment indicator, determining valuation techniques to be used and determine which method or approach to learning will be done by the teacher.

Based on the above data, show that the SPS-oriented science learning at an early stage, the stage of planning, science teachers still have a lot of obstacles. In the determination of the SPS is to be taught to students, as many as 11 of the 26 science teachers or approximately 42,30% of science teachers still have problems. Indicator to determine the achievement of skills in every type of skill that will be taught as many as 21 of the 26 science teachers or approximately 80,77% of science teachers are still having trouble. As for determining the valuation techniques and determine instructional methods or approaches to be used in conducting process-oriented approach to teaching science, as many as 22 of the 26 science teachers or approximately 86,62% of science teachers still have problems.

b. Implementation of Teaching Activities

The second step in learning science oriented SPS is implementing plans that had been developed previously. Success in implementing the SPS -oriented science learning depends heavily on the planning stage. In the implementation phase of the SPS -oriented science learning, as many as 12 of the 26 science teachers or science teachers as much as 46,25% expressed an obstacle. Thus it can be said that many science teachers are difficulties in implementing the SPS -oriented learning

c. Students' science process skills assessment.

Assessment is the latest stage in a teaching and learning activities and one of the very important stage. At this stage of judgment on the success of the learning process will be carried out. The success of the process of planning and implementing the learning process will be seen from the results of the assessment. Therefore, the SPS -oriented learning, assessment of SPS students is very important.

Based on the above data, it can be seen that, in general science teacher at a junior high school level still have difficulty in assessing SPS students. A total of 24 of the 26 science teachers or approximately 92.31 % of science teachers have difficulty in measuring SPS students. This fact is in line with previous research conducted by Sukarno, et al (2013) which states that science teachers in secondary schools in Jambi generally still have problems or difficulties in measuring SPS students. In the study it was mentioned that the difficulty in measuring science teachers SPS students include, preparation of grating instruments, the development of assessment instruments, determining the valuation techniques, validity, level of difficulty, distinguishing about / instrument and perform the analysis of the assessment results of SPS.

c. Experience of science teachers in implementing the learning - SPS oriented

Additional data obtained in this study is about the experience of science teachers in implementing the SPS -oriented learning. This data was obtained by asking the question "have you ever done learning science teachers with the aim to develop SPS students" ? Thus the data obtained in the form of "yes" and "no". Answer "yes" means that the teacher is never done learning which aims to develop SPS students, while the "no" answer means the opposite. Based on the data in Table 1, obtained information that the teacher is still very rarely doing

development-oriented learning SPS students. A total of 15,40 % or 4 of 26 science teachers reported having never done learning experience or SPS oriented while the remaining 84,60 % of teachers stated no experience or have never done SPS -oriented learning .

Based on the above, it is understood that there is a clear link between the difficulties faced by science teachers in implementing the SPS -oriented learning with level appropriateness. This is shown by the data is at least the experience of teachers in implementing the SPS -oriented learning which is about 15.40 % . Science teacher ever implementing learning SPS also still have some difficulties , both in terms of planning , execution and learning in implementing SPS student assessment . While teachers who have no experience or have never done SPS assessment is more likely to have more problems.

The implications of the still many barriers faced by science teachers in implementing science -oriented learning is underdeveloped SPS students optimally. As has been mentioned by Rustaman, et al, (2003) that learning science process skills approach will be able to develop SPS students . Therefore, the barriers faced by teachers in implementing learning science process skills approach will also affect the development of SPS students. Additionally, Sukarno, Permanasari and hamidah, (2013) also stated that the ability of SPS students (SPS basis) which includes ; observation , classification , measurement , prediction , making inferences and scientific communication still dominated by the value of students who score low SPS , ie 43,48 % . Students with lower mean category has obtained test scores between 0-7 points, with a score range of 0-20.

There are many and fundamental obstacles faced by science teachers in Jambi in implementing the SPS -oriented learning is caused by several things , namely ; still relatively low level of knowledge or understanding of the science teachers of the SPS . According to research conducted by Sukarno, Permanasari, Hamida, (2013) , an understanding of the science teachers in Jambi SPS is low . It is based on the understanding of the SPS test scores, where the score is the average score of 60.94 with a range of 1-100. This factor has led to science teachers do not have sufficient knowledge and understanding of the SPS and intact, so that in the planning, implementation and SPS -oriented learning in its judgment also still faces many obstacles.

The second factor is the lack of demand and support, both from public and colleagues. Although in the curriculum stated that teachers should develop students' skills (through various practicum), but in fact there is no meaningful demand for teachers to do, planning and implementation of SPS -oriented science teaching and assessment of these skills. Even in the national exam, the questions related to the SPS is still very little. Besides monitoring the implementation of the SPS -oriented learning by inspectors field of study is still weak. Even according to the teacher during the interview , there is no supervisor who asked , correcting or directing the SPS assessment. On the other hand, support from former colleagues are still low. Deliberation activities teachers science subjects still rarely discussed these SPS -oriented learning.

The third factor is the lack of science teaching materials that inspire and direct the learning of science teachers to perform optimally oriented SPS. Even if there is a suggested teaching materials science learning science teachers to do with a particular method that allows the development of SPS , such as lab work, demonstrations, inquiry and so forth, but it is not followed by an evaluation procedure for SPS is concerned. The questions in these materials are generally still oriented to cognitive assessment. Whereas the role of instructional materials is very important for the learning of science. According to Reiser, et al (2003): "... Instructional materials can serve as learning materials for both students and teachers. They can serve a primary source of science content, present specific views about the nature of scientific practices, and how scientific knowledge is developed. Materials can also serve as a primary influence on how teachers should teach science ".

Based on the above, it can be drawn a red line that the lack of assessment of SPS on junior high school students because there are still many problems associated with the science of learning -oriented approach or SPS itself. Therefore, to increase awareness and knowledge of science teachers in implementing the learning science process skills approach or SPS -oriented students as had been required in the curriculum, the authors offer some solutions to overcome the obstacles faced by junior high school science teachers. Some of these points are as follows:

1. Need to do training or workshop on SPS and assessment for teachers and supervisors of science subjects as well as the assistance of the experts during the process until science teachers truly professional in implementing the SPS -oriented learning. Training or workshop for science teachers is intended for science teachers have a thorough understanding of the concept of SPS.

2. There needs to be a serious demand from the government in this case through a national final exam to include questions that measure or assess SPS. It is also intended that the field of science teachers have a degree of seriousness in implementing the planning, learning and assessment SPS.
3. Science teaching materials need to be developed that is able to inspire and lead teachers to make learning science process skills approach that gives great opportunities in the development of SPS and SPS assessment in an integrated, focused and continuous.

Hopefully all interested parties in this case are the government and teachers can make the best measures related to SPS student assessment. With the increased understanding of the science teachers SPS is expected on the planning, implementation and assessment of learning SPS will also be conducted in a focused, integrated and continuous. The end result of all of that of course is the hope of improving the quality or the quality of education in Indonesia.

4. Conclusions and Recommendations

Based on the data and description of the above discussion, it can be drawn a conclusion that in general science teachers still have obstacles in planning, implementing learning approach to the assessment process as well as SPS students. A total of 15,40% or 4 of 26 science teachers reported having experience or have had SPS measurements while the remaining 84,60% of teachers stated no experience or have never done SPS student assessment. The main cause is the existence of various problems faced by science teachers associated with the learning process approach and understanding of the science teachers are not comprehensive SPS. As for the problems faced by science teachers in implementing the SPS-oriented learning is in terms of planning, implementing learning and in terms of measuring SPS students.

Related to the above results, the following are the recommendations proposed by the authors, namely:

1. Need to do the training workshop on SPS and its implementation in science learning in schools for teachers and supervisors of science subjects and the assistance of the experts during the process until science teachers truly professional in implementing SPS-oriented learning.
2. There needs to be a serious demand from the government in this case through a national final exam to include questions that measure or assess SPS. It is also intended that the field of science teachers have a degree of seriousness in conducting SPS-oriented learning.
3. Science teaching materials need to be developed that is able to inspire and lead teachers to make learning science with a process approach that provides opportunities for the development and assessment of an integrated SPS, directed and continuous.

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Biography:

Sukarno, is a candidate doctor on Science Education of graduate school-Indonesia University of Education. He received a Master of Education management from Islamic Institute, IAIN STS Jambi in 2009. He received a Bachelor of educational Science from University of Jambi in 2003. He research Science Teacher Understanding to Science Process Skills and Implications for Science Learning at Junior High School (www.ijsr.net), The Profile of Science Process Skill (SPS) Student at Secondary High School (www.ijser.in) . The field of research in education is on science literacy.

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