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Teachers' Perception towards Science Process Skills (SPS) in Elementary Schools

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Abstract. The purpose of this study is to describe teachers' perceptions towards the application of SPS in Elementary Schools in accordance with the current curriculum in Indonesia, namely 2013 curriculum. SPS is an important skill to be mastered by students so that they can understand other science concepts. In addition, SPS is important to improve scientific attitude and to produce a science product. This research is a qualitative research. The method of data collection is using questionnaire. The data were analyzed using descriptive and content analyses. The results showed that SPS has been facilitated in the 2013 curriculum and integrated with 21st century skills. Teachers understood the importance of SPS in Elementary Schools, and some teachers had tried to apply the learning that facilitates the SPS. However, they still had difficulties in setting up objective and valid assessment instruments in accordance with indicators of achievement. Therefore, it is necessary to develop assessment instrument in the form of tests to measure SPS.

INTRODUCTION

SPS is the skill integrated with 21st century skills [1][2]. The skill is very important to be mastered by students to prepare their competitiveness in facing global competition (MEA), especially at Elementary School level. The level is a good time to instil 21st century skills especially SPS. The importance of embedding this SPS is also evident with the facilitated SPS in the 2013 curriculum [3][4][3]. It shows that Indonesian government gives attention to SPS. The curriculum emphasizes the learning process by using scientific approach. The approach is closely related to SPS. Students are expected to be able to use scientific methods in acquiring new knowledge and develop the knowledge already possessed [3][5][6]. This SPS-oriented learning places teachers as facilitators so that they are no longer the only sources of learning available in the classroom. In the learning activities, students are directed to actively use knowledge and SPS to solve a problem provided by the teacher.

The science process skill (SPS) is divided into two levels, namely basic and integrated science process skill [1][7][8][9][10]. The basic skill of SPS includes observation, classification, communication, measurement, prediction and intervention. The integrated skill of SPS includes 5 skills such as identifying, and controlling variables, defining in an operational manner, formulating hypotheses, experimenting (must be able to design and test hypotheses by using existing procedures to obtain reliable data), interpreting data and making conclusions.

Previous research has made it clear that SPS deals with scientific attitudes, learning concepts, and scientific products generated through the learning process [11]. SPS determines how students' scientific attitudes can be formed, how their understanding of concepts can be obtained fully, and how they can implement what has been learned by producing a scientific product that is useful for life. Learning that emphasizes SPS can increase students' science literacy and science attitudes[1][12][13]. This is in line with the revised 2013 curriculum in 2017. The revised results show that there are several new things emphasized in the 2013 curriculum, one of which is the science literacy in which there is SPS.

SPS, which is an important component of Elementary School learning. Teachers should master and understand the concept of SPS, apply SPS in learning in elementary school in line with government regulations, in addition, teachers should be able to evaluate SPS that has been owned by students. Evaluating the SPS that students already possess is important to improve students' SPS [14][15]. Based on this, it is important to know the perception of teachers regarding SPS. Teachers' perceptions towards SPS are very important to know in order that development can be implemented in the learning process in accordance with the needs of the teachers in instilling SPS for Elementary School students. Therefore, the purpose of this research is to find out teachers' perceptions towards SPS in Elementary School in accordance with 2013 curriculum.

METHOD

This research employed qualitative method in form of case study. The instrument of the research is a questionnaire given to 75 teachers in Surakarta, but only 62 teachers filled out and returned the questionnaire. The questionnaire consisted of 12 questions to be answered by the respondents. The data from the questionnaire was collected, and each question item was analysed. The techniques of data analysis used is descriptive and content analysis. Below are the question items of the questionnaire about teachers' perception towards the SPS implementation on Elementary School students in accordance to 2013 curriculum:

TABLE 1. The descriptions of the research instrument

	Aspects	Question numbers
A	Teachers' understanding about SPS and its relationship with the government policy.	A-1, A-2, A-3, A-4
B	The implementation of SPS in Elementary School learning	B-1, B-2, B-3, B-4
C	SPS assessment in Elementary Schools	C-1, C-2, C-3, C-4

Each item is followed by four answer choices; they are Strongly Agree (SS), Agree (S), Disagree (TS), and Strongly Disagree (STS). The teachers were free to choose one of the choices based on the *status quo* in each school

RESULT AND DISCUSSION

Based on the analysis of questionnaire data, the data about teachers' perceptions towards SPS in Elementary School were obtained. The data were divided into three aspects; they are: (1) understanding of the teacher to the SPS and its relation to government policy, (2) the implementation of SPS in Elementary School learning, and (3) the assessment of SPS in Elementary schools.

The Teachers' Understanding of SPS and its Relation to Government Policy

Based on the results of questionnaire analysis, it was found that there is the teachers' understanding of SPS and its relation to the prevailing government policy, namely the 2013 curriculum. This aspect consists of three points of statements in the questionnaire filled with teachers, namely the teachers' understanding of the concept of SPS in Elementary School (A-1), the importance of SPS development in Elementary School learning in accordance with 21st century skills (A-2), facilitated with SPS in the 2013 curriculum (A-3), and the importance of applying SPS in thematic learning (A-4). The results of the data analysis can be seen in Figure 1.

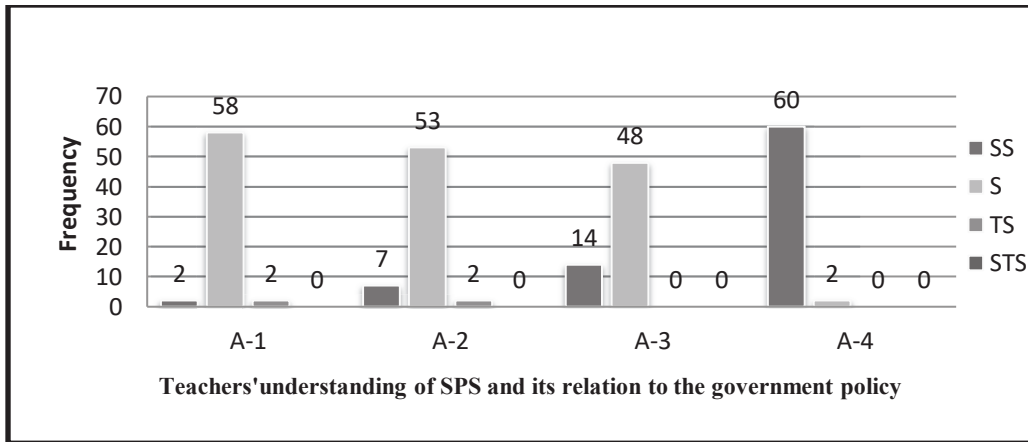


FIGURE 1. Graph of teachers' understanding of SPS and its relation to government policy

The graph above shows teachers' understanding of SPS and its relation to government policy. Based on data analysis in point A-1, it shows that 58 out of 62 teachers agreed that teachers should understand the concept of SPS in Elementary schools. 2 teachers stated that they strongly agreed and 2 teachers expressed their disagreement. Item A-2 shows that 53 teachers agreed that SPS is a skill that needs to be developed in Elementary School learning. 7 teachers strongly agreed and 2 teachers disagreed. Item A-3 shows 48 teachers agreed that the application of SPS has been facilitated in the 2013 curriculum, and 14 teachers agreed. A-4 shows that 60 teachers strongly agreed that SPS is important in the application of thematic learning in primary schools and 2 teachers agreed. Based on these results, it can be seen that most teachers have understood the concept of SPS and known its relation to the Indonesian government policy in relation to the curriculum that applies at this time. This is in line with the previous research which states that SPS is one part of science literacy and is one of the skills emphasized in 2013 curriculum [1][4][13]. SPS is also integrated with 21st century skills that can improve students' competitiveness in facing global competition (MEA) [1][2].

Teachers' Perceptions towards the Implementation of SPS in Elementary School Learning

Based on the results of the questionnaire analysis, it was found that SPS has been implemented in the learning process by the teachers of Elementary Schools. This aspect consists of three points of statements in the questionnaire, namely teachers' mastery of SPS-oriented learning strategies (B-1), the implementation of learning process that accommodates SPS (B-2), student's enthusiasm in following the learning process conducted by the teachers (B-3), and SPS improvement of students through learning that has been implemented (B-4). The results of the data analysis can be seen in Figure 2.

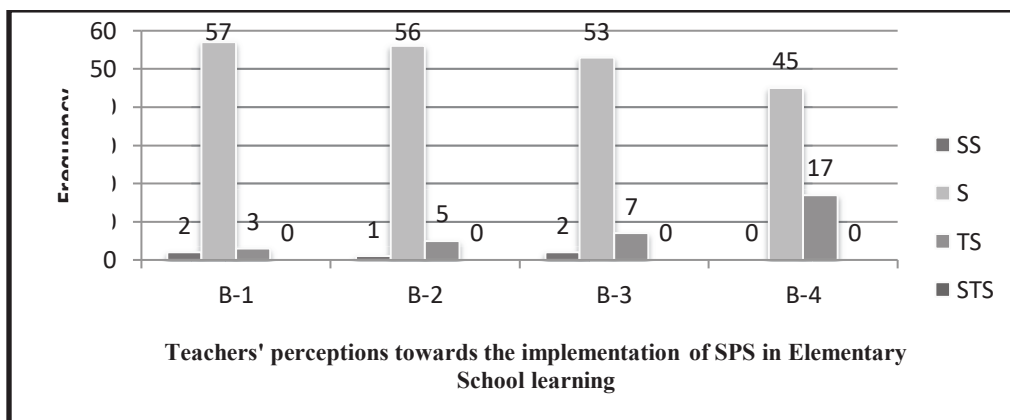


FIGURE 2. Teachers' perceptions towards the implementation of SPS in Elementary School learning

The graph above shows the teachers' perceptions of SPS implementation in Elementary School learning. Point B-1 shows that 57 teachers agreed that they need to master learning strategies to instil SPS in Elementary School students; 3 teachers disagreed; and 2 teachers stated strongly agreed. Item B-2 shows that 56 teachers agreed that teacher-centred learning at present has accommodated SPS for Elementary School students; 5 teachers disagreed, and one teacher strongly agreed. Item B-3 shows that 53 teachers agreed that the students are enthusiastic in following the learning process conducted by the teachers so far; 7 teachers disagreed; and 2 teachers strongly agreed. Item B-4 shows that 45 teachers agreed and 17 teachers disagreed. Based on these results, it can be seen that most teachers in Surakarta have mastered the learning strategies oriented to SPS; and they have implemented it so that students are also enthusiastic in following the learning process. It has also been described in the previous research that SPS-oriented learning is designed to make the students actively participate in the learning process. They are directed to find new knowledge and develop the knowledge they have, so that they will enthusiastically follow the learning, by which learning objectives will be fulfilled [3][16][17]. However, in point B-4, it seems that there are still many teachers who feel they have not seen the improvement of student's SPS, it can be caused by the learning process or assessment instrument used by the teacher has not been able to measure student's SPS. Therefore it is necessary to do further reflection to find the cause and the solution.

Teachers' Perceptions towards Science Process Skills (SPS) in Elementary Schools.

Based on the results of questionnaire analysis, the data on SPS assessment in Elementary Schools were obtained. This aspect consists of four items, namely the availability of SPS assessment instruments in the 2013 curriculum (C-1), objectivity and validity of SPS assessments used by the teachers (C-2), teachers' need for SPS (C-3) assessment, and SPS assessment using the test instrument (C-4). The results of the data analysis can be seen in Figure 3.

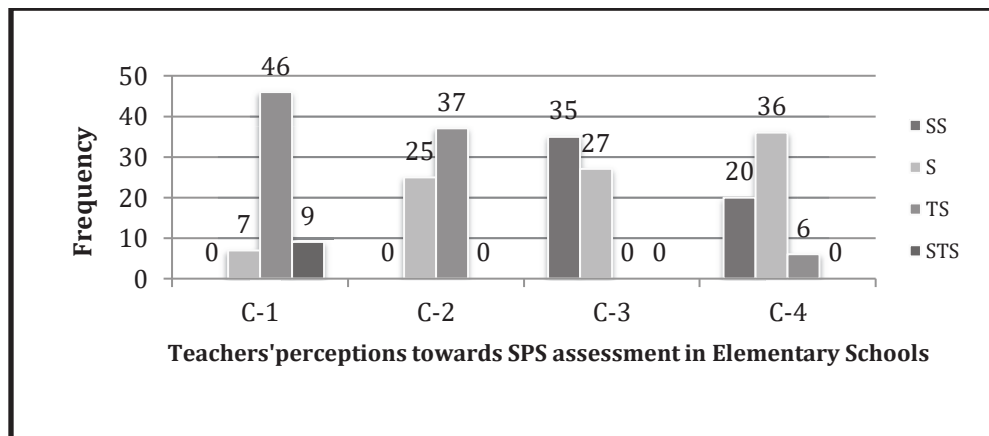


FIGURE 3. Teachers' Perceptions towards Science Process Skills (SPS) Assessment in Elementary Schools.

The graph above shows the teachers' perceptions towards SPS assessment in Elementary Schools. Item C-1 shows that 46 teachers disagreed that SPS assessment has been described in the 2013 curriculum; 9 teachers strongly disagreed; and 7 people agreed. Item C-2 shows that 37 teachers disagreed that the SPS assessment method that has been implemented is valid and objective; and 25 teachers agreed. Item C-3 shows that 35 teachers strongly agreed that there should be a development of SPS assessment in accordance with the 2013 curriculum so that the assessment results would be valid and objective; and 27 teachers agreed. Item C-4 shows that 36 teachers agreed that SPS can be measured using test instruments; 20 teachers strongly agreed; and 6 teachers disagreed. Based on the results of the analysis, it can be seen that there is no explanation about the SPS assessment. Although the application of SPS learning has been facilitated in the 2013 curriculum, the teachers feel that the current assessment of SPS is still less valid and objective. They need valid and objective SPS scoring instrument. They agree that the test instrument can be an option for measuring SPS of Elementary School students. This is supported by the previous research which states that there are several types of test instruments that can be used in measuring SPS [2][14][15][18].

CONCLUSION

Based on the results and discussions, it can be concluded that SPS is an important skill for students. Teachers have understood the importance of SPS in Elementary School learning. Teachers are able to apply SPS-oriented learning because it has been facilitated in the 2013 curriculum, but in the assessment process teachers have difficulties in measuring student SPS validly and objectively. Teachers need assessment instruments that are easier to use to get valid assessment results. One of the options is through test instrument. Therefore, it is necessary to develop SPS assessment instruments in Elementary Schools in accordance with the 2013 curriculum.

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