Analysis of science process skill in high school students

N A Atush Sholihah*, Sarwanto, and N S Aminah
Physics Education, Post Graduate Program Sebelas Maret University, Indonesia

*Corresponding author: nurainy317@student.uns.ac.id

Abstract. Science Process Skills (SPS) are all scientific skills used to acquire, develop, and apply scientific concepts and theories. Mastery of Science Process Skills is not only useful in science learning but also for the daily life of students. This study aims to obtain a profile analysis of students' science process skills. The research method used is a survey method with research subjects, namely at 4 Madiun state Senior High School. Data collection technique used is the test technique. The data obtained were then analyzed by simple statistical analysis. Based on the results of the research that has been done, it can be seen that the ability of Science Process Skills in 4 Madiun state Senior High School students as a for each aspect of Science Process Skills is still low with a percentage of 47%.

1. Introduction
Education is intended to develop students' potential and skills that students can develop in living life in society, nation and country, where one of the skills expected is Science Process Skills [1]. Science process skills emphasize the formation of knowledge acquisition skills, and communicating their acquisition.

Science process skills are the ability of students to apply scientific methods in understanding, determining and developing science [2]. Science process skills are very important for students to use scientific methods in developing science and are expected to acquire new knowledge or develop existing knowledge. The scientific method, scientific thought patterns, and critical thinking are prerequisites for this skill, so that for at least the last two decades, SPS has become more commonly heard. [3]

Based on other opinions science process skills are basic skills that facilitate learning in science, allow students to be active, develop a sense of responsibility, enhance learning and research methods [4]. A science process skill is a person's skill in using thoughts, reason and actions effectively and efficiently to achieve a certain result. In addition, science process skills help students to develop a sense of responsibility in learning and increase the importance of research methods in the learning process [5].

In general science process skills are clarified into basic skills and integrated skills [6]. Basic science process skills include observing, measuring, inferring, predicting and classifying. Whereas integrated science process skills include controlling variables, interpreting data, formulating hypotheses, defining variables operationally, and designing experiments. To measure the science process skills of students can be done by writing, oral, and observation. Science process skills are not hand skills using tools but science process skills think using science processes. Therefore the test subject can be in the form of a written test [7]. In addition, the measurement of science process skills must use clear, valid and coordinated assessments so that the results can be used.

Science process skills need to be applied in teaching and learning activities, because the development of science takes place so rapidly that it is no longer possible for a teacher to give facts and concepts to
students, all concepts that have been discovered through scientific inquiry are not absolute in nature so that they are still open to question, to be questioned, and repaired again [8]. The importance of science process skills is strengthened in a number of standard points stating that each student is expected to be able to build and apply information or knowledge logically, critically, creatively and innovatively.

2. Methods
This research is a descriptive study that aims to determine students' science process skills. Research subjects were 11th grade students in the academic year 2018/2019. The subjects of this study were 50 students from senior high school in Madiun, East Java, namely SMAN 4 Madiun. The method for this research uses science process skill test questions. The question consists of 10 items, which are used to measure the ability of a science process consisting of 5 aspects of SPS, namely compiling, compiling and manipulating data, predicting and assigning data. SPS questions are developed and given later. The correct answer is 1 and the wrong answer is 0.

That applies to all questions from numbers 1 to 10. The results of the science process skills analysis are presented by calculating the number of students the correct answer and dividing it into total students then multiplying by 100%. The percentage value obtained is then categorized based on table 1. This study starts from the process of collecting data, processing data, describing data, and discussing the results with relevant theories as measurements to interpret them [9].

| Assessment (%) | Category   |
|----------------|------------|
| 0 ≤ X ≤ 25     | Very Low   |
| 26 ≤ X ≤ 50    | Low        |
| 51 ≤ X ≤ 75    | Medium     |
| 76 ≤ X ≤ 100   | High       |

3. Results and Discussion
This study uses a multiple choice instrument consisting of 10 questions containing knowledge questions that indicate science process skills. Each indicator of science process skills consists of two questions. The instrument has been adapted from the indicators in the syllabus used by the teacher. Data regarding science process skills of students in SMAN 4 Madiun were obtained after students answered a number of individual SPS questions. Data from testing questions can be seen in table 2.

| Science Process Skill (SPS) Indicator | Achievement of science process skill (%) | Category |
|--------------------------------------|----------------------------------------|----------|
| Observed                              | 52%                                    | Medium   |
| Conclude                              | 44%                                    | Low      |
| Identify and manipulated Data         | 48%                                    | Low      |
| Predictions                           | 44%                                    | Low      |
| Interpreted Data                      | 48%                                    | Low      |

Based on Table 2, it can be seen the results of each indicator of science process skills skills respectively: observing 52%, including 44%, identifying and manipulated data 48%, prediction 44%, and interpreted Data 48%. Table 2, provides an overview of the achievement patterns of the student categories for each indicator. Data on the distribution of student categories for each indicator is shown in Figure 1.
Figure 1. Chart Student SPS each aspect SPS

Figure 1 shows the data distribution of the category of science process skills, which shows that there is only one aspect that appears with the medium category and the rest in the low category. The SPS aspects of students that appear in the medium category are the aspects that are observed. Whereas aspects of SPS students that appear in the low category are aspects of inferring, identifying and manipulating variables, predicting, and interpreting data. This shows that SPS students for each aspect are generally in the low category, where on average students are only able to answer correctly as much as 47% of every aspect of SPS tested.

This low indicator of science process skills is due to the assessment of these tests which tends to focus on concept competence. Science process skills have several positive impacts on student achievement. Previous research shows that there is a positive relationship between students' academic achievement and students' scientific process skills [10-12]. Academic achievement and science process skills are related to students' conceptual change processes.

4. Conclusion
Based on the results of research and analysis, it appears that the Science Process Skills of Students at SMAN 4 Madiun are low, which only has a percentage of 47%. From the 5 aspects of science process skills, only one aspect is in the medium category. The other four aspects show a low category. For the future research, it is suggested to improve students' science process skill with appropriate learning method and assessment instrument.

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