

ANALYSIS OF SCIENCE PROCESS SKILLS OF HIGH SCHOOL STUDENTS IN MEDAN CITY

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ARTICLE INFO:

ABSTRACT

Article History

Received March 10st, 2024

Revised March 15st, 2024

Accepted March 17st, 2024

Keywords:

*Science process skills,
Communication aspect, Planning
the experiment*

This research aims to determine the results of science process skills in four state schools in Medan City. This type of research is descriptive with a quantitative approach. Samples were obtained from 4 schools using Cluster Sampling based on the criteria for State High Schools in Medan City, namely MAN 1, MAN 2, State High School No. 3, and State High School No. 4 Medan. Using science process skills test question for class XI student on Biology subject. Using descriptive analysis technique by calculating average data values. The result of this research is that students' science process skills at four state schools in Medan City average 74.74. The highest value is in the communication aspect and the lowest is in planning the experiment.

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How to Cite:

Mukra, R., Nuzalifa, Y.U., Septiani, F. Rahmawati, S. (2024). Analysis Of Science Process Skills Of High School Students In Medan City . *Jurnal Pelita Pendidikan*, 12(1). 001-004.

INTRODUCTION

Science process skills are scientific methods which involve practicing the steps to discover something through experiments and experiments (Eliyana, 2020). Process skills involve cognitive or intellectual, manual and social skills. Cognitive or intellectual skills are involved because by carrying out process skills students use their minds.

Manual skills are clearly involved in process skills as they may involve the use of tools and materials, measuring, arranging or assembling tools. Social skills mean that they interact with each other in carrying out teaching and learning activities with process skills, for example discussing the results of observations.

Not only that, in general, process skills are also a process approach in teaching natural sciences based on observations of what a scientist does (Hartati et al, 2021).

The types of process skills in the science process skills approach can be developed separately, depending on the method used. For example, in the demonstration method certain process skills can be developed, namely: making observations, interpreting observations, grouping (classification), predicting, communicating, hypothesizing, planning experiments or investigations, applying concepts or principles (Rustaman, 2005).

Learning is designed to include science process skills consisting of basic process skills (basic science process skills) and advanced process skills (integrated science process skills) (Handayani, 2018).

In accordance with Anggraeni (2017) who said that process skills need to be sharpened through activities carried out directly as a learning experience, because with activities carried out directly, individuals will better understand the process or activity they are carrying out.

Research conducted by Fadillah (2017) shows that skills can be described using written test instruments in the form of reasoned multiple choice questions. The use of written test instruments will help researchers in assessing scientific process skills in carrying out observations or discussion methods that have

been used so far. In order to truly assess students' science process skills, this written test must produce data that is able to present all information regarding students' science process skills correctly and relevant to the material being taught.

From the results of observations made at state high schools in the city of Medan, there is an obstacle that teachers still rarely give tests with science process skills questions. These problems cause the learning objectives to not be achieved.

Widdina et al (2018) state that teachers can take part in training on science process skills in order to have a comprehensive understanding and knowledge about the types of science process skills, skill development and assessment of science process skills.

Table 1. Material on Science Process Skills questions

No	Topic
1.	Cells as the smallest unit of life, bioprocesses in cells
2.	The structure and function of cells that make up tissue in plants and animals
3.	The structure and function of cells that make up tissue in the movement system
4.	The structure and function of cells that make up tissue in the circulatory system
5.	The structure and function of cells that make up tissue in the digestive system
6.	The structure and function of cells that make up tissue in the respiratory system
7.	The structure and function of cells that make up tissue in the excretory system
Total = 7	

METHOD

Research Place

This research was carried out at 4 state schools in the city of Medan, namely MAN 1 Medan, MAN 2 Medan, SMA Negeri 3 Medan, and SMA Negeri 4 Medan.

Procedure

The instrument used is a multiple choice test to determine the level of students' science process skills in odd and even semesters.

Science Process Skills

To calculate the test scores for students' science process skills in the aspects of observing, interpreting data, hypothesizing,

planning experiments, applying concepts, communicating, grouping (classification), predicting (prediction), this is done by looking for percentages and presenting them in the form of scores. Data on students' science process skills can be calculated using the following formula:

$$\text{Value} = \frac{\text{score obtained}}{\text{score total}} \times 100$$

Table 2. Criteria for Students' Science Process Skills Values

No	Value	Criteria
1.	86-100	Very Good
2.	70-85	Good
3.	56-69	Average
4.	≤55	Poor

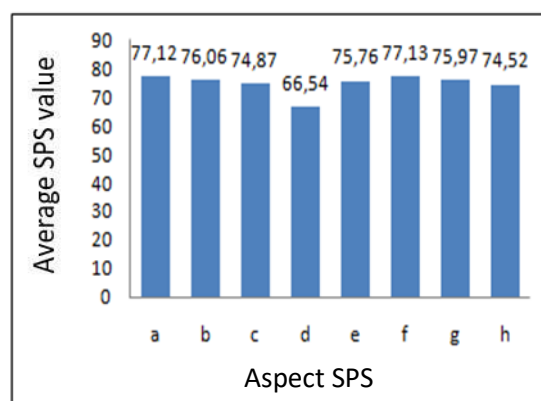
Data analysis

The data in the form of numbers is then processed and the average value, highest value and lowest value are then known.

RESULTS AND DISCUSSION

Science Process Skills

The science process skills measured in this research are (a) observing (b) interpreting data (c) hypothesizing (d) planning experiments (e) applying concepts (f) communicating (g) grouping (h) predicting. The average value of science process skills can be seen in Figure 1:



Based on Figure 1, it can be seen that the science process skill scores of students at 4 state schools in Medan City are in the good category with an average of 74.74. The highest value is in the communication aspect and the

lowest is in planning the experiment. According to Aswadin et al (2019) it also shows that the communication aspect has the highest score with a very good category.

An explanation of the value of students' science process skills in each aspect is as follows. Aspects of science process skills such as observing, interpreting data, hypothesizing, applying concepts, grouping and predicting are also included in the good category. This is supported by the availability of adequate facilities so that biology material practicum is carried out and the practicum fulfills several aspects of the process skills above which have an impact on students' ability to answer questions in each aspect and obtain good results.

In general, the results of science process skills are in the good category, but there is still one aspect that is in the sufficient category, namely planning experiments. This is because in the questions with these indicators there is practical biology material that was not carried out, so that students' mastery of the aspect of planning experiments is less than optimal. Competence and activeness from teachers is really needed in this case, to carry out practicums in laboratories that are full of skills, so that students can master all aspects of science process skills as a whole.

Science process skills that are classified as good, such as the results of the research above, cannot be separated from the role of a teacher in applying science process skills to students in biology learning. In accordance with research by Damapolii et al (2019) which states that teachers' contributions are important in managing student learning outcomes. To be able to obtain a better picture of students' science process skills, teachers must prepare science process skills tests and be competent in how to measure them.

Likewise, Malik (2016) stated that teachers need to carry out learning and approach students' science process skills to help students' knowledge. Rabacal (2016) explains that in teaching biology teachers also need to design programs, activities and exercises that will help improve students' science process skills.

In the learning process, students are required to be active and become the center of the learning process, and are required to think, analyze, evaluate and conclude for themselves what the problems are in each material studied in order to solve these problems, the teacher only guides, encourages and provides facilities. for a student to achieve a learning goal (Aseptianova, 2019).

CONCLUSION

Science process skills are in the good category with an average of 74.74. The highest value is in the communication aspect and the lowest is in planning the experiment.

To teachers, laboratory assistants and principals of State High Schools throughout Medan City to better support the implementation of better learning such as applying science process skills.

ACKNOWLEDGMENT

Thanks are expressed to those who contributed to this research, resulting in the data obtained and the creation of this article.

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