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THE PROFILE OF FIFTH-GRADE STUDENTS' SCIENCE PROCESS SKILLS AT MIN IN PONTIANAK CITY

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Abstract
Science process skills are one of the important skills for elementary children because they can provide a solid foundation for scientific understanding, the development of critical thinking skills, and the development of useful abilities throughout life. This research aimed to outline the science process skills profile of fifth-grade students at all Madrasah Ibtidaiyah Negeri (MIN) in Pontianak City. The research used the descriptive method with a quantitative approach. The population of this research is all fifth-grade students of MIN in Pontianak City. The sampling technique used is Stratified Random Sampling, in which 2 classes are taken as samples randomly from each school. Data were collected using multiple choice test instruments, as well as interviews to collect data on the types of errors that cause low science process skills of students. The results of the study showed that the average student's science process skills only reached 62.3% of each aspect tested. Thus the overall KPS of students at MIN Pontianak City is in the moderate category with an average of 7.2%. Based on the study's findings, it can be concluded that additional efforts are necessary to enhance the science process skills of elementary school students.

Keywords: fifth grade**,** profile, science process skills

Introduction
The word "skill" means ability or proficiency. In terminology, skill refers to the ability to perform tasks by job competencies that can be observed from the results. The key to producing good quality is through process. This process involves coordinating the design of each component involved and can be thought of as a technique that is planned or designed to guide and evaluate learning. The learning process in educational institutions is designed to be interactive, inspiring, enjoyable, challenging, and motivating, encouraging students to actively participate and develop themselves according to their interests, talents, and physical and psychological growth (Sakdiah & Syaharani, 2022).

Science includes products, processes, attitudes, and technology. Therefore, in science learning, students are not only given knowledge (products), but must also be actively involved in learning by seeking knowledge, proving it through practicum or experimentation, drawing conclusions, and finally creating tools or technology to solve community problems (Kristyowati & Purwanto, 2019). These skills include aspects such as the foundation of natural science, attitudes that prioritize the scientific method, and the ability to think critically are aspects which are important in developing understanding and expertise in science (Rustaman in Suryaningsih, 2017). Learning science through a process skills approach enables students to achieve the objective of understanding science concepts while also developing fundamental science skills, scientific attitudes, and critical thinking abilities (Suryaningsih, 2017). Science process skills (SPS) are all skills needed to understand, develop, and apply natural science concepts, laws, and theories can be categorized as science process skills.

According to Padilla (1990) in Science - A Process Approach (SAPA), science process skills are defined as a set of abilities that can be broadly applied across various scientific disciplines and reflect the behavior of scientists. SAPA categorizes these skills into two types: basic and integrated. Basic science process skills are simpler and foundational, including observing, predicting, measuring, communicating, classifying, and predicting. Integrated science process skills are more complex and involve controlling variables, defining operationally, formulating hypotheses, interpreting data, experimenting, and formulating models. The stages of science process skills outlined in this study are as follows: 1) Observation Skills: Students use multiple senses to gather information, identifying and collecting relevant facts about objects. 2) Making Predictions: Students use observed patterns to suggest potential outcomes in unobserved situations. 3) Measuring: Students use tools or materials to gather data, understanding why and how these tools and materials are used. 4) Communicating: Students describe empirical data from experiments or observations using graphs, tables, or diagrams. 5) Classifying: Students observe differences and similarities, determine characteristics, compare results, and find bases for grouping or classifying observations. 6) Predicting: Students connect observation results, find patterns in a series of observations, and draw conclusions or interpretations.

Science process skills are an integral element that is crucial for the development of students at the primary school level. They are not just technical skills, but the very foundation that empowers them to reach higher levels of scientific literacy. The ability to use the scientific method in all aspects, from careful observation and systematic data collection to data interpretation and drawing appropriate conclusions, are key components that form the core of students' scientific development. In a broader view, science process skills not only influence the learning and understanding of scientific concepts but also encourage students to become critical, analytical, and skeptical individuals in their approach to information. They will be trained to ask questions, seek evidence, and understand the basics of the scientific method which can help them in dealing with everyday problems and making informed decisions. Therefore, the development of science process skills at the primary school level is not only about forming future scientists but also forming competent citizens in facing the challenges of a modern world that is increasingly integrated with science and technology. In this context, educators

play a central role in equipping students with the knowledge tools, and skills needed to develop scientific literacy and a deep understanding of the scientific method (Özalp, 2023).

The importance given to science process skills in basic education is indeed very prominent, and its emphasis on training aims to significantly enrich students' learning experience. Science process skills are not simply an add-on or supplement to the curriculum, but an important foundation that forms the core of their science education. By deepening science process skills, students in primary schools are allowed to better understand and feel a close affinity with the scientific method. They learn to view the world around them through a critical lens, ask relevant questions, and observe natural phenomena. Their learning experience becomes more thorough and involved as they are invited to actively engage in experiments, field observations, and systematic data collection. In addition, science process skills also open the door to the development of critical thinking, analytical, and problem-solving abilities that will be very useful in various aspects of students' lives outside the classroom. They become trained to solve problems with a scientific approach, explore deeper knowledge, and make decisions based on facts and evidence. When students in primary school have rich and deep learning experiences through the application of science process skills, they are building a solid foundation for more advanced and complex scientific knowledge in the future. This is why it is important to place a strong emphasis on developing science process skills early on so that students can gain maximum benefit from their science education and face the future with confidence supported by a deep scientific understanding (Chrisnawati et al., 2022).

From the previous explanation, it can be concluded that the definition of science process skills (SPS) can be interpreted as various scientific skills that are useful in scientific activities to find something. This includes basic and integrated science process skills. In this study, the process skills used are basic science process skills including observing, measuring, classifying, predicting, concluding, and communicating. The importance of science process skills for students, especially elementary school students, is that students will learn to see the world using a critical lens, problem-solving, analytical, development of thinking skills, asking relevant questions and observing natural phenomena carefully, this also provides experiences for students that aim to build important foundations to build the core of education. The importance of developing science process skills at the primary school level is that it creates a solid foundation for further scientific understanding in the future, as well as helping students bring scientific passion and confidence to their daily lives. Through this immersive learning experience, students not only acquire knowledge, but also experience the essence of the scientific method, and this will bring long-term benefits to their intellectual and academic development (Rintayati et al., 2020). Thus, the role of science process skills in basic education is not just to produce students who can memorize scientific facts, but to create learning that triggers cognitive growth, problem-solving, and in-depth exploration. Students who have a strong foundation of science process skills can step into the world with sharper thinking abilities, as well as the potential to make meaningful discoveries and integrate scientific concepts into their daily lives (Widyaningsih et al., 2020)

However, in practice, there is a fact that students' science process skills are still low. Research findings by Anam (2014), which involved 30 representative

students from 30 MI in Sumedang Regency in Madrasah Science Competency activities, reinforced the weakness of Science Process Skills (SPS). The results showed that on average students only had low proficiency in four types of process skills, namely observing, planning experiments, classifying, and making tables. In addition, they are also not proficient in inferring skills. The results of research conducted by Sukarno et al. (2013) also showed that the science process skills of junior high school students in Jambi were still low in the skills of making conclusions, observing, predicting, measuring, and classifying. Based on observational data, it appears that the level of participation of students in science learning activities in 6th grade is still low, only reaching 40% (Afidin et al., 2022).

The science process skills of elementary school students are still relatively low because teachers rarely conduct experiments in science teaching. This can result in a lack of in-depth understanding of science concepts. Teachers need to improve their learning strategies by incorporating more experimental practices in the curriculum. In this way, students will have more opportunities to observe, test hypotheses, and develop science process skills more comprehensively. Thus, they will be able to build a solid foundation for understanding the complex world of science (Rustan et al., 2020). Based on initial observations, it was revealed that the knowledge of science process skills among elementary school teachers is still minimal. This suggests that serious efforts are needed to improve their understanding of this important aspect of science learning. By strengthening teachers' knowledge of science process skills, it is expected that they will be able to teach science materials more effectively and motivate students to actively engage in the learning process. This is an important step in building a strong foundation for the development of students' science competencies at the primary school level (Chrisnawati et al., 2022). Based on the above description of the importance of science process skills for students, research is needed to analyze the profile of Science Process Skills of elementary school students in MIN Pontianak City.

Method

The method used is descriptive research with a quantitative approach. According to Sugiyono (2022), descriptive research is conducted to determine the value of one or more independent variables without making comparisons or connecting them with other variables. The population of this research is all 5th-grade students of Madrasah Ibtidaiyah Negeri (MIN) in Pontianak City which consists of 4 Madrasah Ibtidaiyah Negeri (MIN) namely MIN 1 Pontianak, MIN 1 Filial Pontianak Saigon, MIN 2 Pontianak and MIN 3 Pontianak. From the four Madrasahs, researchers chose the Stratified Random Sampling technique, namely from each school 2 classes were taken to be sampled randomly.

The data collection technique is a test technique with multiple choice question instruments developed by Anisa et al., (2023). Data collection methods are methods and instruments used in a study to collect and process data in an organized and structured manner (Sukmawati, Sudarmin, & Salmia, 2023). Collecting data on science process skills by calculating the scores obtained by students when working on multiple choice questions, so as to get a percentage value of the science process skills of students of Madrasah Ibtidaiyah Negeri. To make it easier to analyze the data, researchers made indicators of each aspect of basic science process skills data collection by including six aspects of basic science process skills modified from.

The aspects of basic science process skills are observing, measuring, classifying, predicting, concluding, and communicating skills.

SPS questions were developed and administered following expert validation (judgment expert). The data obtained from the students' SPS tests were then analyzed using simple statistical analysis methods and classified according to the table provided below

Table 1. Categories of assessment of science process skills

No	Score	Categories
1	0 - 3	Very Low
2	4 - 6	Low
3	7 - 9	Average
4	10 - 12	High

As for calculating each aspect of students' SPS, the following formula is used.

$$(\%) = \left(\frac{Students' \ Score}{Maximum \ Score}\right) \times 100 \qquad (1)$$

Then the percentage of each category is translated based on the following table:

Table 2. Science process skills categories

No	%	Category
1	0 - 25	Very Low
2	26 - 50	Low
3	51 - 75	Average
4	76 - 100	High

Sumber: (Rahayu & Anggraeni, 2017)

Findings and Discussion

Data on Science Process Skills of MIN Pontianak City students were obtained by giving several SPS questions to students individually. To analyze the data, first, the number of correct answers of each learner was calculated. Furthermore, the students were grouped based on the number of correct answers they obtained, according to the categories that had been previously determined. More detailed information about the SPS ability of students in each MIN studied can be found in Table 3.

Table 3. Students' SPS categories of each MIN in Pontianak City

School name	Σn	Students' SPS				Students' average score
		VL	L	A	H	
MIN 1	90	1	21	57	11	7.5
MIN 2	84	5	25	52	2	6.9
MIN 3	72	1	12	47	12	7.1
MIN 1 Filial	73	3	11	46	13	7.6
Total	19	10	69	202	38	29.1
Percentage	-	3.1	21.6	63.3	11.9	7.2
Category	Average					

Based on the table above, it can be seen that there are 2 Madrasah Ibtidaiyah that have Science Process Skills (SPS) scores above the overall average of students. However, all the average scores of the 4 Madrasah Ibtidaiyah in this study showed a medium category in terms of students' SPS. This finding is in line with research conducted by Sukarno et al. (2013), It is stated that the students' low Science Process Skills (SPS) are due to several factors, such as: 1) teachers' limited KPS abilities; 2) insufficient learning materials to develop and enhance students' KPS; and 3) a lack of guidance in creating assessment instruments focused on KPS for both teachers and students. In addition Rillero, (1998) emphasizes that individuals who are not able to apply SPS will experience difficulties in everyday life.

The percentage results of the overall Students' SPS Profile of MIN in Pontianak City students can be seen in the following chart:

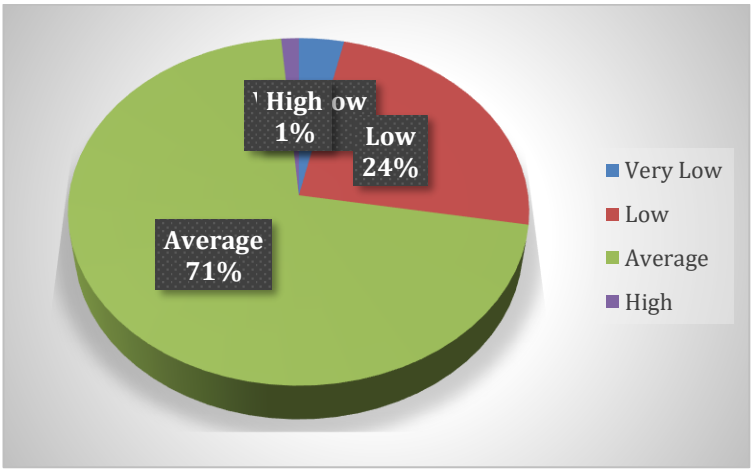

Figure 1. Percentage chart of students' SPS profile of MIN in Pontianak City

Based on the table and graph above, it can be seen that the average value of students when viewed from the average value of KPS only reaches 7.2%. Thus overall it can be concluded that the KPS of MIN in Pontianak City students is still in the average category. Problematic students' science process skills have several impacts. First, it hinders their ability to fully engage in online learning during the Covid-19 pandemic (Handayani & Setyawati, 2022). Second, it affects the understanding and application of science concepts, especially when the learning model emphasizes receiving information from the teacher (Kadmayana et al., 2021). Third, it limits their ability to infer, organize data, control variables, and formulate models, among other skills required for scientific inquiry (Saban et al., 2019). Fourth, it inhibits their ability to formulate problems and hypotheses, which are critical for meaningful learning and scientific thinking (Astuti, 2019). Lastly, it contributes to learning difficulties in certain topics, such as human blood circulation organs, due to factors such as low attention, motivation, and inappropriate teaching methods (Maryani et al., 2018).

The next step of analysis is to examine and categorize the correct answers of students in each aspect of Science Process Skills (SPS). To get a deeper understanding of the extent of SPS of Madrasah Ibtidaiyah students in Pontianak in each aspect of SPS, please refer to Table 4.

Table 4. Profile of each aspect of students' SPS in MIN Pontianak City

No.	Aspects of KPS	Correct Number	%	Category
1.	Observing	400	63	Average
2.	Measuring	355	56	Average
3.	Classify	443	70	Average
4.	Predict	262	41	Low
5.	Summarizing	474	74	High
6.	Communicating	446	70	Average
	Total	2380	62.3	Average

Based on table 4. It can be seen that of the 6 aspects of SPS tested in the SPS question there is only 1 aspect in the high category, the rest appear in the average and low categories. The aspects of students that appear in the high category are concluding, for the medium category there are aspects of observing, measuring, classifying, and communicating. While the aspect in the low category is predicting. Based on the interview process with some of the samples of fifth-grade students in all MIN Pontianak, the researcher determined the evaluation criteria with four types of errors as follows:

Table 5. Type of error caused by students of MIN in Pontianak City

Error Type	Description
1	Fooled by the answer options
2	Less thorough
3	Problems still contain concepts
4	Guess

After the researcher established the categories of error types, the next action involved interviewing the students. The results of this interaction were then systematically recorded and neatly organized in the following table. The percentage breakdown describing the results of this analysis is as follows:

Table 6. Percentage of students' interview results in MIN Pontianak City

SPS	Error Type	MIN (%) 1	2	3	Filial
Observing	1	0	0	0	0
	2	0	0	0	0
	3	10	50	50	25
	4	20	0	12.5	37.5
Measuring	1	10	0	0	0
	2	0	0	0	12,5
	3	20	75	37.5	75
	4	0	25	12.5	0
Classifying	1	0	100	0	0
	2	10	0	0	37.5
	3	10	75	50	12.5
	4	30	25	0	37.5
Predicting	1	0	50	0	0
	2	0	0	0	12,5
	3	80	12.5	100	0
	4	20	0	0	75
	1	10	100	50	0

SPS	Error Type	MIN (%) 1	2	3	Filial
Summarizing	2	0	0	0	75
	3	10	25	0	25
	4	50	25	25	12.5
	1	30	0	37.5	37.5
	2	0	0	0	12.5
Communicating	3	10	75	0	0
	4	30	50	0	0

Based on the data above, it can be seen that in analyzing the causes of errors in type 1 and type 2, it was found that the error rate in all MINs was 0%. Next, the causes of errors in type 4 were measured. The results show that the error rates in MIN 2 and fillial have the same percentage, which is 75%. Classification was done on the most frequent causes of errors in type 1, and the findings showed that the most dominant cause of errors was in MIN 2, with an incidence rate of 100%. The same is true for type 3, where the researcher found that the most frequent cause of error lies in MIN 3 with an incidence rate of 100%. The researcher concludes that the most unique cause of the error is found in type 2, especially in the filial MIN with an incidence rate of 75%. This is interesting because the error rate in MIN 1, 2, and 3 in type 2 is 0%, while the filial MIN has an error rate of 75%.

It is important to note that type 2 has very unique characteristics, where the error rate only appears in MIN filial with a percentage of occurrence of 12.5%. Students' SPS, especially basic SPS, needs to be improved to enter the high category. This shows that students' SPS of MIN in Pontianak City for each aspect is generally in the average category, where on average students are only able to answer correctly 62,3% of each aspect of the KPS tested. There is a similarity between the results of this study and the results of research from Anam (2014) showing that on average students are less proficient in four types of process skills, namely observing, planning, experimenting, classifying, and making tables.

In the observing aspect, 63% of students made mistakes in answering the questions. Among them, 20% still guessed the question when facing the observing aspect of the question, indicating that the student's ability to observe the question is still inadequate. These factors collectively contribute to the low observed science process skills in science. The cause of the lack of students' observation skills in science subjects at the primary school level is often due to teaching approaches that are more likely to be instructive and centered on the role of the teacher. In this case, students lack the opportunity to develop their observation skills optimally because their active involvement and interaction are not emphasized enough. This also impacts students' ability to understand and apply scientific concepts in a practical context. Therefore, a more learner-oriented teaching approach is needed, where they have an active role in the learning process and are directed to practice their observation skills more skillfully and effectively (Minarni & Napitupulu, 2018).

The cause of low science process skills in science (Integrated Science) is attributed to several factors. One of the main causes is the short teaching experience of science teachers, which affects their ability to effectively teach and develop students' science process skills (Suryani et al., 2022). Another factor is the educational background of science teachers, which may not be linear with their

competence in teaching science process skills (Aulia et al., 2023). In addition, the lack of appropriate teaching materials and methods in the classroom may hinder students' engagement and limit their opportunities to develop science process skills.

In addition, the lack of experience and understanding of lab topics among physics education learners may also contribute to their low science process skills. In the aspect of predicting, 41% of cases were recorded where the most frequent error type was error type 3, indicating that the question still holds concepts that should be concept-free in science process skills. The low skills of elementary school students in solving prediction problems can be attributed to several factors. One of the main causes is a weak understanding of concepts, which causes difficulties in applying them (Smith et al., 2023). In addition, it is noted that learners may experience deficiencies in developing critical thinking and reasoning skills. These skills are essential in solving prediction problems (Sulianto et al., 2020). Therefore, special attention needs to be given to the development of critical thinking and reasoning skills in learners, so that they can be more competent in predicting and solving problems more effectively. While in the aspect of classifying 70% of the most errors appear in type 4, where students still have difficulty in classifying or categorizing information in the problem.

On the other hand, 30% of learners are still unable to answer questions by classifying or categorizing information. The results of this study reveal that learners' participation in science learning activities is still at an unsatisfactory level, which then has a direct impact on the achievement of their learning outcomes. These factors together influence the classification of science subjects at the primary school level as a low- performing category. Therefore, increasing students' participation in science learning as well as improving learning outcomes is crucial to improving the quality of science education at the primary school level. These efforts need to continue to be made so that the quality of science education can improve significantly and have a positive impact on the development of learners (Degita et al., 2019). In terms of making tables or communicating information, the percentage indicating that learners performed moderately was 70%. This indicates that the frequent error types are types 1 and 4, with the same percentage of 30%. In this context, the majority of learners still tend to guess the questions and are fooled by the answer choices on the questions. The study concluded that the lack of opportunities to engage in relevant practical activities is one of the main factors affecting the low science communication skills of primary school learners.

Hands-on experience in conducting experiments or direct observation in the field has a significant positive impact on learners' ability to communicate scientific ideas and findings clearly and effectively. Therefore, steps are needed to expand opportunities for learners' participation in practical activities so that they can better hone their science communication skills. This will contribute greatly to improving the quality of science education at the primary school level (Degita et al., 2019). Moreover, there are limitations in measuring skills experienced by students. As many as 56% of them often experience errors in type 3, which indicates that the questions still contain concepts that require deeper understanding inhibiting learner engagement and limiting their opportunities to develop science process skills (Setiawan & Sugiyanto, 2020). This emphasizes the need for improvement in the preparation of evaluation instruments to ensure that the concepts tested are in accordance with the measuring skills of students (Rochman et al., 2022).

Thus, process skills require development through learning experiences that involve direct interaction with the material or activity being carried out. Through this direct experience, individuals can go deeper and appreciate the process or activity that is being undertaken. Therefore, it is important to develop process skills through direct experience as a form of deeper learning experience.

Conclusion

Based on the results of the research conducted, it can be concluded: In general, the science process skills of Madrasah Ibtidaiyah students in Pontianak are still low with the average value of SPS only reaching 7.2%. Overall, the science process skills of Madrasah Ibtidaiyah students in Pontianak still show a low level in each aspect of SPS, with a percentage of 62.3%. The low level of science process skills in students raises demands for teachers in planning and implementing Science learning that is expected to be able to advance students' SPS at the Madrasah Ibtidaiyah level.

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