Identification of Science Process Skills of Group B Students at Kreativa Gebang Kindergarten

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Abstract: The newest Curriculum stipulates a scientific approach as a characteristic of the national PAUD curriculum. In reality, kindergartens still have not optimized this. Therefore, it is necessary to identify the science process skills of early childhood students so that improvements can be made immediately. This research aims to identify and analyze the science process skills of Group B Students at Kreativa Gebang Kindergarten. This is descriptive research. The research instruments used were video recordings of learning activities, observation sheets for learning activities, and student development assessment reports (LPPA). The data obtained in this research was analyzed using a combination of analysis (quantitative – and qualitative). The results showed: 1) The identified science process skills of Group B students were observing, classifying, and communicating skills; 2) The percentage of achievements in observing skills that were categorized into developing very well (BSB) categories were 41.4%, Classification skills were at 32.8%, and communication skills were at 14%. Based on the data, it can be concluded that the science process skills of group B students at PAUD Kreativa Gebang were still relatively low because the percentage of achievements in the three science process skills that were categorized into developing very well (BSB) categories was below 50%.

Keywords: Kindergarten; PAUD; Science Process skill

Introduction

Science is known as the study of events or phenomena that occur in nature. Meanwhile, conceptually science is defined as a conceptual scheme that is related to each other by a series of experiments and observations and can be tested further. Science can be viewed as a process, product, or attitude dimension. Science as a process is a way to obtain knowledge, while science as a product can be facts, concepts, principles, laws, and theories, while science as a scientific attitude means beliefs, opinions, and values that must be maintained by a scientist when seeking or developing a new knowledge(Izzuddin, 2019).

Preschool science is science aimed at young children so they can understand science from a child's perspective. Nowadays, introducing science to young children is very important. Indeed, science can encourage children to think critically. Furthermore,

thanks to science, children do not simply accept or reject a certain thing/phenomenon they encounter. Educating children to acquire scientific competencies can help parents and children develop the ability to actively defend themselves against negative information or phenomena around them (Munastiwi, 2015).

Science as a process is also called science process skills. Science process skills or science processes are skills for studying natural phenomena in certain ways to obtain and develop that knowledge further (Bundu, 2006). According to (Nugraha et al., 2017) science process skills are all the skills needed to acquire, develop, and apply scientific concepts, principles, laws, and theories, whether in the form of mental, manual physical, or social skills.

According to (Bundu, 2006), specifically, the development of process skills focuses on observation skills, formulating hypotheses, designing experiments, interpretation, and communication skills. These

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scientific process skills do not develop and work automatically but need to be trained so they can grow and develop well. Through the scientific activities carried out, children will experience the scientific process, so it can be said that children's scientific process skills will be more developed and trained.

Scientific process skills are not something special in science, because these skills are skills commonly used by scientists who work in the field of science. Although other approaches support and are interrelated with this approach, they are always oriented towards active student learning activities that develop process skills through clear design and direction. The steps taken by scientists to gain natural knowledge are known as the scientific method. The scientific method is a way to prove, discover, or refute knowledge based on evidence that can be measured and observed. The scientific method is used by scientists when carrying out experiments to learn various scientific concepts that they are involved in. Scientific process skills in early childhood learning allow children to process new information through experimentation. The most appropriate skills for early childhood are observing, classifying, comparing, measuring, communicating, and experimenting. Sharpening these skills is very important to face various challenges in everyday life as well as for future studies in gaining new knowledge (Izzuddin, 2019).

Integrated science processing skills are necessary to become a scientifically literate person. Integrated science processing skills are the ability to understand scientific concepts and recognize the relevance of science and technology to life. Scientific knowledge is influenced more by mastery of skills related to the scientific process than just by understanding key concepts (Özgelen, 2012). The paradigm of education has changed, aspiring to produce a generation of young people who think like scientists. A critical generation that does not necessarily accept the knowledge provided, but understands the process (Sadiqin et al., 2017).

First steps before practicing and teaching science process skills in school, teachers must know and understand the profile of students' science process skills. It will help the teachers to make the learning environment ideal to support all of the student's needs to increase their science process skills. Teachers also will understand better aspects of students' science process skills which still need to be improved or even need to be shown during learning. So this research is important to profiling the students' science process skills so teachers know what science process skills need to be improved. It is hoped that the results of this study also can be used as assessment materials by educators to improve not only children's science process skill but also their understanding of science.

Method

This research is descriptive research with a non-experimental approach. This research took place at PAUD Kreativa Gebang - Mataram. The subjects of this research were 72 group B students at PAUD Kreativa Gebang-Mataram. The research instruments used for data collection were video recordings of learning activities, observation sheets for learning activities, and student development assessment reports (LPPA PAUD). The data that has been collected in this research are: First, data on the learning process carried out in the classroom to collect potential problems that exist in learning activities. Overall, the data obtained in this research was analyzed using a combination of analysis (quantitative – and qualitative) as suggested by (Sugiyono, 2019). Data was analyzed by following the steps according to (Fatimah, 2020).
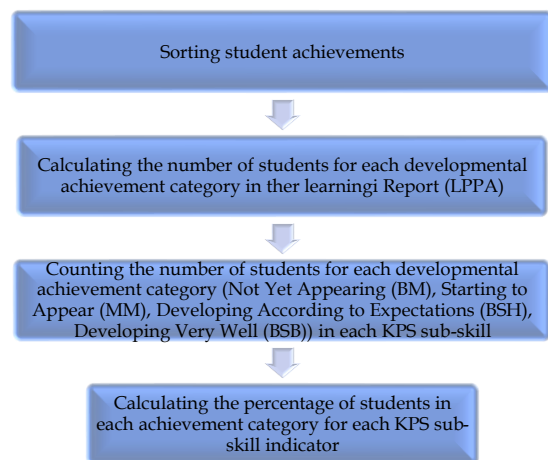

Figure 1. The flow of Research Analysis

Calculating the percentage of students in each achievement category for each KPS sub-skill indicator using Formula 1.

$$\% \ achievement \ Category = \frac{Number \ of \ student \ for \ category \ BM,MM,BSH,BSB}{The \ number \ of \ students \ x \ The \ number \ of \ each \ indicators} x \ 100\% \qquad (1)$$

Percentage of the total number students in each category for KPS using the following formula :

$$\% \ achievement \ Category = \frac{Number \ of \ student \ for \ category \ BM,MM,BSH,BSB}{The \ number \ of \ students \ x \ The \ number \ of \ indicators} \ x \ 100\% \qquad (2)$$

Result and Discussion

This research was conducted in June 2023 at PAUD Kreativa Gebang Mataram. The subject was group B students with a total of 72 students. Based on the assessment report, observation sheets, and learning video obtained 14 indicators related to science process skills for early childhood students. More details are shown in the Table 1.

Table 1. Identification of Observation skills of group B students at PAUD Kreativa Gebang.

Development Indicators of Early Childhood Students	Achievement Category				Percentage (%)			
	BM	MM	BSH	BSB	BM	MM	BSH	BSB
Distinguish the texture of objects using the sense of touch	0	0	45	27	0	0	64.3	38.6
Distinguish the sound of the initial letter in sentences	0	0	10	60	0	0	14.3	85.7
Mention numbers when the number symbol addressed	0	0	46	24	0	0	65.7	34.3
Recognize taste with the sense of taste	0	0	70	0	0	0	100	0
Recognize objects in the surrounding environment based on size, nature, aroma, function and other characteristic.	0	2	37	31	0	2.8	52.8	44.3
Recognize objects by connecting or matching the names of objects with other objects.	0	5	33	32	0	7.1	47.1	45.7
Total	0	7	241	174	0	1.6	57.3	41.4

Based on the table above, it can be seen that of the 6 indicators of observing sub-skills, the most mastered by students in the very well-developed category is the fourth indicator, namely distinguishing initial letter sounds with an achievement of 85.7%. The least indicator in the very well-developed (BSB) category is knowing taste with a sense of taste of 0%. In differentiating tastes, children have difficulty distinguishing salty from savory. This is because they cannot differentiate between the two properly. The salty taste can usually be felt on the edge of the tip of the tongue, while the umami taste can be felt throughout the tongue and lasts longer on the tongue. So all students are classified as developing according to 100% expectations.

In the science process skill of observing, there are no indicators that are classified as not yet emerging (BM). The emerging (MM) category is only 2.8% and 7.1%. This indicates that the observation ability of group B students is quite good.

Observation is the most fundamental science process skill that is acquired by learners when they learn about the world around them through the use of senses to gather first-hand information (Hamlin & Wisneski, 2012; Majoko, 2017) To improve students' observation skills, (Forman & Hall, 2005) stated teachers must know their students well. Teachers must observe them first, to know what method, techniques, or learning media they can use to enhance their observation skills.

Table 2. Identification of Classification skills of group B students at PAUD Kreativa Gebang.

Development Indicators of Early childhood Students	Achievement Category				Percentage (%)			
	BM	MM	BSH	BSB	BM	MM	BSH	BSB
Grouping the same and similar objects	0	0	15	55	0	0	21.4	78.6
Grouping objects in the surrounding environment based on size, nature, aroma, texture, function, and characteristics	0	5	22	43	0	7.1	31.4	61.4
Grouping objects based on the concepts of big – small, many – few, long – short, heavy – light, high – low	0	6	24	40	0	8.6	34.3	57.1
Total	0	11	61	138	0	2.6	14.5	32.8

The table above shows that of the 3 indicators included in the scientific process skills of classifying, there are 78.6% included in the BSB category, namely the indicator Grouping the same and similar objects. The scientific process sub-skill indicator for classifying with the lowest BSB percentage is the indicator Grouping objects based on the concepts of large - small, many - few, long - short, heavy - light, and high - low. In this classification skill, there are no indicators that are classified as not yet emerging (BM). For the category starting to emerge (MM), there are only 7.1% and 8.6% of the indicators. Grouping objects in the surrounding environment based on size, nature, aroma, texture, function, and other characteristics and Grouping objects based on the concepts of large - small, many - few, Long – short, heavy – light, high – low. This indicates that the child is able to classify objects/objects quite well.

Table 3. Identification of Communication skills of group B students at PAUD Kreativa Gebang.

Development Indicators of Early childhood Students	Achievement Category				Percentage (%)			
	BM	MM	BSH	BSB	BM	MM	BSH	BSB
Used to praise God's creation	0	0	47	23	0	0	67.1	32.8
Retell what was heard with greater vocabulary	7	21	32	10	10	30	45.7	14.3
Express feelings, and ideas with appropriate word choices when communicating	6	22	30	12	8.6	31.4	42.8	17.1
Explain the surrounding environment in simple terms	4	26	30	10	5.7	37.1	42.8	14.2
Create a story by arranging a series of pictures	10	20	36	4	14.3	28.6	51.4	5.7
Total	27	89	175	59	6.4	21.1	41.6	14

From the data in the table above, there are 32.8% of children fall into the BSB category, namely from the indicator that they usually praise God's creation. The indicator with the lowest BSB category is making a story by assembling a series of pictures with a percentage of 5.7%. However, when compared with other science process skills, communication skills are still relatively low, because the percentage of students in the not yet emerging (BM) category is still high. Starting from 10%

to 14.3%. This indicates that the communication skills of creative group B PAUD PAUD students are relatively poor. Based on the results of classroom observations, most students still have difficulty expressing what they feel and their ideas with the right words or sentences. Their vocabulary is also still limited, so when they are asked to tell or explain what they saw or felt, they are confused about choosing the right words and sometimes misrepresent what they want to say.

Table 4. The Total of Science Process Skills of group B students at PAUD Kreativa Gebang.

Students Science Process Skills	Number of students in each achievement category				Persentage (%)			
	BB	MM	BSH	BSB	BB	MM	BSH	BSB
Observation skills	0	7	241	174	0	1.6	57.3	41.4
Classifying skills	0	11	61	138	0	2,6	14.5	32.8
Communication skills	27	89	175	59	6.4	21.1	41.6	14
Number of students Per Category	27	107	477	371	2.1	8.4	37.8	29.4

The table above shows that of the 3 AUD science process skills for group B PAUD Kreativa Gebang, it is known that the most achieved by students in the BSB category is observation skills with a percentage of 41.4%. As many as 32.8% of students have science process skills in classifying in the BSB category and the lowest is science communication skills with a percentage of 14%. This indicates that the science process skills of group B students at PAUD Kreativa Gebang are still relatively low because, for the three science process skills identified, the percentage of achievement in the very good category is below 50%.

Learning to communicate is the key for children to interact with others. In early childhood education (henceforth: ECE), communication is important to help children build academic skills and feel confident in learning. Effective communication should take place with shared meaning and understanding between teachers and children in early childhood settings (Velentzas & Broni, 2014). Children learn to express thoughts, feelings, and information through communication (Gooden & Kearrns, 2013). One type of communication often used in ECE classroom interactions is verbal face-to-face formal or informal communication (Bubikova-Moan et al., 2019). Oral communication may include speech acts. An effective communication strategy builds and maintains connections, allowing interactions to work efficiently toward the learning goals.

Figure 2. Learning Process in Kreativa Gebang Kindergarten

Introducing children to science from an early age helps them begin to think critically and logically. Science helps children experiment, explore, and observe their surroundings. It can gradually develop children's personalities, familiarize themselves with scientific thinking, practice problem-solving, and demonstrate strong analytical skills. Children's science is anything surprising, easy to find, and considered fascinating, that

can provide knowledge or inspire children to learn and explore. Encourage children to prepare for learning holistically, aiming not only at mastering concepts but also at scientific process skills (Kermani & Aldemir, 2015).

Markawi, (2013) believes that scientific process skills (SPS) are skills that scientists possess, comprehensive and systematic skills, analysis based on

logical thinking and methodology, including physical and mental activities, to explore, absorb, understand, and master science. Scientific processing skills have a positive impact on increasing problem-solving ability, improving scientific literacy (Handayani et al., 2018), ability to make decisions in daily life, enhancing students' creative thinking skills (Asy'ari et al., 2017), enhancing critical thinking skills (Nugraha et al., 2017). So, it is important to improve and enhance science process skills from the beginning. Although in this research the science process skills are relatively low, this data will be used for further research. This also can be the trigger to put more effort into training and enhancing students' science process skills. According to (Rusmini et al., 2021), effort is needed to train science process skills to prospective chemistry teachers to produce teachers who have good science process skills. A good teacher will teach well to his students. The results of this study contribute to science learning in the future by science process skills. Teachers need to use more variations in learning media or techniques to gain students' high science process skills. Using computers or multimedia can be one of the answers. (Siahaan et al., 2017) said that computer multimedia can be used as an alternative to improve science process skills. The students can perform simple experiments using a digital laboratory and can get similar or even the same results as if they conduct real experiments.

The approaches of learning also support the children's learning of science, where the learner has to actively pose questions, plan research, collect data, draw conclusions, and communicate received results to others (Minner et al., 2010) and support the learning of science process skills (Bunterm et al., 2014). Inquiry-based learning is a recommended approach in teaching science for all ages and especially in small children's science education (Samarapungavan et al., 2011); (Samarapungavan et al., 2008). Other than learning media or learning tools, the learning approach also can improve science process skills according to this research results. It is important to choose a learning approach wisely based on what students need the most. In the Kreativa Gebang Kindergarten, the learning approach that was often used was the teacher-centered approach. Most of the time, students didn't have the opportunities to explore and create their own experiments. So that's why the students' science process skills do not develop well.

Conclusion

Based on the research results and discussion above, it can be concluded that; The identified science process skills are observing, classifying, and communicating skills. The science process skills of group B students at PAUD Kreativa Gebang are still relatively low because the percentage of achievements in the three science process skills identified in the very good category is below 50%.

Conflicts of Interest
The authors declare that there is no conflict of interest regarding the publication of this paper.

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