



Science Process Skills in Implementation Food Test Practicum in Junior High School

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Abstract: Science process skills are one of the components of psychomotor competence, these skills can support student activities to acquire knowledge. In learning activities having science process skills is something that is very important for students. This study aims to measure and find out the concept of applying and understanding science process skills in the science learning process, especially in food testing practicum. This type of research on food test material is qualitative descriptive research. The research was conducted on class VIII students of SMP Muhammadiyah Al-Kautsar PK Kartasura Sukoharjo. In this study, there were two data that were examined, namely the first data from the results of student science process skills observations. The research was conducted through three stages, namely pre-survey, implementation, and drawing conclusions. The second data collection was based on the teacher's knowledge of science process skills and the approach to the science teaching process by using interview techniques with science subject teachers in schools. The data obtained from the research were analyzed using quantitative and qualitative methods. The data shows that the overall understanding and application of students' science process skills based on the results of observations shows a good category, namely 76.3%. The conclusion drawn is that the science process skills approach to SMP Muhammadiyah Al-Kautsar PK students is in a good category. Based on the results of interviews with science teachers, the results show that so far, the lecture method is the method most often encountered and implemented by teachers in learning science. In fact, the implementation of science practicum is very important. In the practicum method, it is hoped that students will be able to interact directly with objects as well as be able to empower various competencies, especially being able to develop science process skills.

Keywords: Learning Science; Practicum; Science Process Skills

Introduction

In the 2013 curriculum, there are four core competencies (Mulawarman, 2021). Students should have these competencies in the learning process to seek knowledge. Among them is the competence of social attitudes, spirituality, skills, and knowledge (Suryawati et al., 2010; Murti & Subali, 2023). These competencies are interrelated with one another. The learning activity is a very comprehensive process. Examples of science learning which include Physics, Chemistry, and Biology are very identical to experiments where this activity requires being able to be in the field of skill competencies

(Khoiri et al., 2021; Kismiati et al., 2022; Arifin et al., 2021).

In the education environment, these skill competencies are often referred to as science process skills. In the teaching and learning process, the skill in question is that students are required to be able to learn by seeking their own experience, the truth of a natural event, and then trying to find the law of propositions. In the end, students are able to draw conclusions from the process they have gone through (Diani, 2015; Supena et al., 2021).

When students carry out practicum-based learning, it is hoped that students will succeed in developing concepts well (Duda et al., 2019; Rahman, 2019;

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Norhaedah et al., 2020). An example is associating the observed results using previously held theories. On the other hand, so that students are able to solve science problems, the method is to do learning repeatedly, especially in a practicum in the laboratory (Novianti, 2011).

Everything in the laboratory, including the type of equipment, is the most important infrastructure in helping the process of improving the teaching and learning process. This process is stated in Government Regulation Number 19 of 2005 concerning National Education Standards, namely article 42 paragraph (2) along with article 43 paragraph (1) and paragraph (2).

Science process skills in the field of teaching science are also very important to implement and develop. The background is because it is seen as being able to improve skills in solving the problems that have been mentioned as well as being able to maximize students' rational thinking skills (Tilakaratne & Ekanayake, 2017). Students who carry out science process skills when studying science are able to easily accept learning experiences. This learning experience is actually very meaningful and can help to improve to a higher and more critical level of thinking.

Science process skills are defined as a series of events that must be possessed by students in seeking to obtain good results and used as provisions to obtain new knowledge information for themselves (Bahtiar & Dukomalomo, 2019). To develop it, it is important to find the basis and analyze it first. Among them is the concept of students' science process skills to understand it (Murniasih et.al, 2013).

In addition, it can be interpreted that these skills must be owned by students so that in the future they are able to discover and develop a lot of knowledge, especially knowledge in the field of science that can be utilized in the community. The ultimate goal as capital relates to the development of science in order to gain

knowledge/new things or to be able to maximize existing knowledge (Afrizon et.al, 2012). It can be interpreted as a process approach to conveying natural science based on observations made by scientists (Rusman, 2013).

Science process skills are aligned with constructivist learning theory (Ping et al., 2020), namely, students find and construct their own knowledge. Is a component used by the teacher in terms of influencing the development of student science process skills in teaching and learning methods? In Alkan's explanation (2016), experimental learning can be applied through experiments in the laboratory. This function can make students more responsible in understanding research methods. The opinion of Suaidy & Soetjipto (2016) said that the inquiry method can prove that this method is suitable for teachers to convey science. These methods turned out to be useful for increasing achievement, then they could also provide stimulants for students to be active in the learning process.

Method

The method in this research is descriptive using qualitative research. This research was conducted through three stages, namely the pre-survey, implementation, and final stages of drawing conclusions.

Research data were analyzed quantitatively and qualitatively. The subjects used were class VIII students at SMP M PK Al Kautsar. In this study, data collection techniques were carried out using observation techniques, namely by using observation sheets, written tests using multiple-choice tests, and documentation. The indicators of science process skills assessed in this study are indicators according to Tawil & Liliasari (2014) which consist of 11 indicators.

Table 1. Indicators of Science Process Skills

Indicator	Sub-Indicators
Observation	Using sight and collecting appropriate facts
Calcification	Record all observations
Interpretation	Contrast results and features
Prediction	Convey circumstances that may occur, in circumstances that have never happened before
Communication	Compile then be able to report clearly Present the experimental results clearly and in detail
Asking question	Ask questions based on the hypothesis
Propose a hypothesis	Recognizing that one explanation requires a truth test
Planning an experiment	Identify materials, sources, tools to be used and select the appropriate steps or work instructions
Using sources, materials, and tools	Using sources, materials and tools
Implement the concept	Applying the concepts that have been learned are then applied in the current situation
Conduct experiments/investigations	Carry out a concept, experiment or investigation

Apart from the data that has been collected, the researcher has prepared an instrument in the form of an

interview test which will be submitted to the teacher in charge of teaching science at SMP Muhammadiyah Al

Kautsar PK Kartasura Sukoharjo. The questions contained questions regarding the science learning approach that had been implemented in schools including three interview questions, the contents of which were:

1. Does the teacher have a correct understanding of science process skills?
2. What is the science learning approach that has been implemented in schools so far?
3. How often do teachers carry out practicum at school? What is your reason for doing science practicum activities?

Result and Discussion

Based on research conducted at the Muhammadiyah Al Kautsar Middle School PK Kartasura Sukoharjo Laboratory for the 2021/2022 Academic Year, the results obtained are as follows:

The recapitulation that has been obtained from research observations of each indicator of science process skills and their percentages is shown in Figure 1.

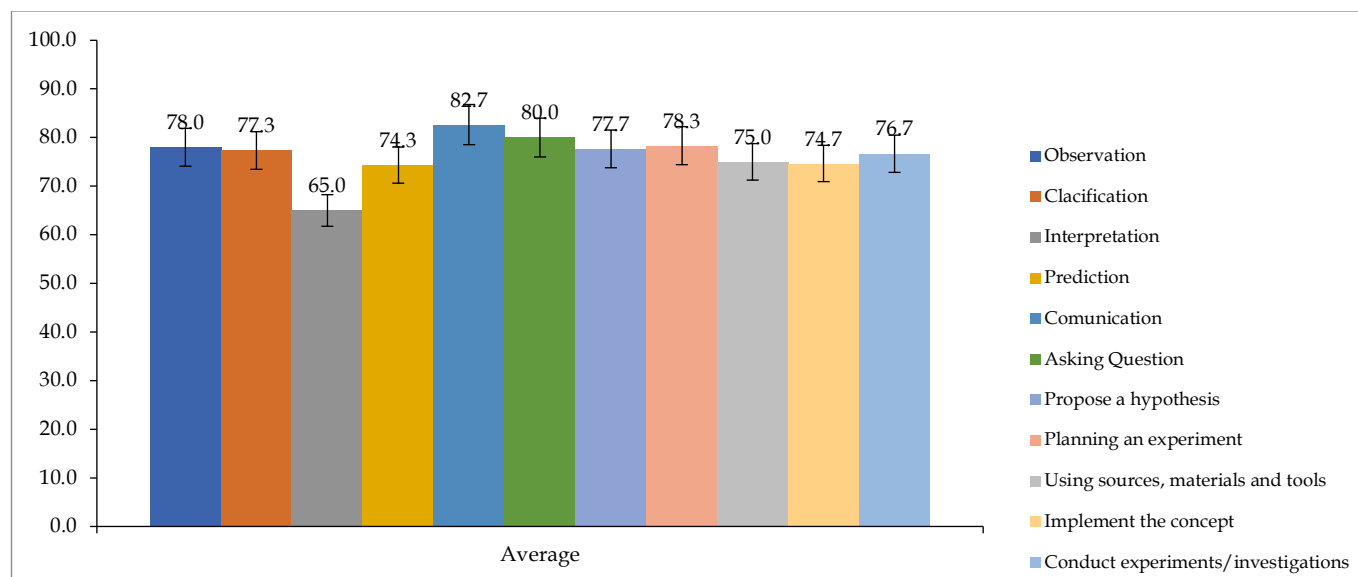


Figure 1. Research Results Diagram (Level of Mastery of Students)

From the data obtained from observations in research, stated that the highest results were on indicators of communicating in the good category. While the indicators of interpreting and communicating get the lowest category with the sufficient category. On other indicators all get good category. Based on these results, the overall results of research and observations have been carried out in the Food Test practicum for class VIII students of SMP Muhammadiyah Al Kautsar PK Kartasura with a percentage of 76.3% in the good category.

The results of the answers obtained from the three interview questions sourced from science subject teachers who actively participated in the research are briefly and clearly listed in the explanation below:

The first question is about "does the teacher understand science process skills?"

Know the name but don't know exactly how the form and system are used when teaching science. What is understood is that science process skills are the same

as the more well-known scientific method and is clearly stated in the curriculum used.

The second question contains the question "What are the approaches to learning science that have been applied so far?"

Science learning that is often used so far is by explaining the material normally, namely directly or orally. Delivered through the E-module then do practice questions or record a summary of the explanation. Sometimes there is time for questions and answers or discussion.

The third question is about "How many times a year do you usually carry out practicums and why do teachers carry out science practicum activities?"

The teacher explained that in the last semester that had passed, they had only carried out practicum once. Practicums can be carried out because of many considerations, namely considering the material, then looking for tools and materials that are easy to obtain, cheap, practical ways of working, and do not burden students.



Figure 2. Practicum Activities in the Laboratory

This description has the aim of answering several questions about the description of science process skills for class VIII students of SMP Muhammadiyah Al Kautsar PK Kartasura Sukoharjo. Figure 1 shows that in the 11 indicators that have been measured through observations, it is concluded that communication skills are the skills that have the highest score, while interpreting skills have the lowest score.

If these values are arranged systematically from the highest score to the lowest score, the results are skills in communicating, asking questions, planning experiments, observing/observing, submitting hypotheses, conducting experiments or investigations, grouping/classifying, using materials and sources, applying concepts, foresee/predict, interpret/interpretation. The research ran smoothly, even though there were a few obstacles but not significant. In the research that has occurred, it has been revealed that the science process skills implementation indicator obtained a percentage result of 76.3% which is in the good category.

Previous research, namely Senisum's (2021), reported that communication skills are a skill that also scores the highest when compared to other science process skills. The factor that influences student science process skills is the choice of a learning approach, one of which can use a learning approach called the inquiry approach (Jaya et al, 2022). The results of interviews

obtained with science subject teachers in terms of learning approaches turned out to be really influential. In detail, the learning approach uses a scientific approach. That approach is contained in the 2013 curriculum, which discusses several phases of activity including asking, observing, gathering some information, asking, observing, associating, then communicating everything that happens.

For Skills in interpreting/interpreting is the skill that gets the lowest score when compared to other skills which can be seen from the data analysis. This is why practicum is important because students acquire many skills. If students rarely or never do a practicum, students will have difficulty interpreting an event. Because interpreting is giving an opinion or impression, or a theoretical view of something.

The teacher is actually the most important controller in the learning process at school, both the center of which lies with the teacher or the students who become it. What has been applied by the teacher, including all the instruments that have been attached to an approach, is very influential on student science process skills. When conducting interviews with teachers whose questions were "does the teacher understand science process skills?" the answer is that the teacher only ever knows about the science process skills designation. However, they do not know the form and its application when teaching science. This means that

the teacher does not really understand science process skills. What becomes the teacher's understanding is that the teacher plays a role in the results of students' science process skills acquisition (Gultepe, 2016). A teacher really needs to understand the importance of science process skills for himself and also students. When a teacher understands, it will tend to be easy to practice it in every lesson. But if you don't understand or don't understand, it will be difficult to be able to apply it.

Based on the results of these interviews due to a lack of understanding about science process skills, the next question arises, namely "How has the science learning approach been applied so far?" Then the teacher answers the science lesson that is often used so far, namely by explaining the material in a direct or oral way. Delivered through the E-module then working on practice questions or recording a summary of the explanation. Sometimes there is time for questions and answers or discussion. In general, the conventional approach is the one that is often implemented in schools. The conventional approach is where a teacher delivers material orally. In fact, this PPP approach is very important, for example, skills in communication as previously stated. Irwanto, et al., (2017) states that the conventional approach here is always applied by students, it becomes a habit to only memorize existing concepts found in material books. This results in when asked to answer a question, the ability to memorize the results will be higher when compared to the ability to think.

In the third question about "How many times a year do you usually carry out practicum and what the reasons for doing science practicum activities?". The teacher explains the learning process of one semester that has passed only one practicum. This practicum is not often carried out because of many considerations, namely paying attention to practicum material, then the material tools are easy to find, inexpensive, and the method of work is chosen to be simple and not burdensome to students. Based on the interview data it is known that the general reason is the limited facilities and infrastructure that do not support it. Another inhibiting factor is the teacher who doubles as a laboratory assistant slows down the course of the practicum which in the end the practicum time exceeds class hours. If you often do practicums, the impact is that many hours are used up so a lot of material is not delivered and is not on target. The reality obtained is that the teacher's target takes precedence over the target that students must accept.

The results of the student responses turned out to be supportive of science process skills to be implemented immediately, the reason being that this approach was considered to be able to improve learning and provide motivation and the potential for students to explore knowledge. In addition, these skills are able to

generate interest in learning, especially in the implementation of practical learning, which in turn improves science process skills. All of this will really be formed by going through a process that is repeated and frequent (Nugraha et.al, 2017).

Conclusion

Science process skills are skills that students need and look forward to in the science learning process. Apart from being able to describe students' abilities in the psychomotor field, this activity shows that from this research it can be concluded that it can actually explore the ability to think logically and critically. From the results of data analysis on the implementation of the Food Test practicum, it shows that the practicum of class VIII students of SMP Muhammadiyah Al Kautsar PK is in the good category with a percentage of 76.3%. The results were obtained from the observation sheet instruments that had been carried out during the practicum. Even though the results obtained are in a good category, the score is still not optimal to support and facilitate the learning process. In addition, the learning approach is also very influential on students' science process skills at school, the approach here is a learning approach that is always used by science subject teachers in the teaching and learning process. However, what happened in this study is in contrast to the results of interviews with subject teachers who said that teachers did not really understand what science process skills meant. The learning method that is often used is limited to conventional learning even though it uses E-Modules as learning support. Teachers rarely carry out practicums caused of several factors including limited supporting infrastructure and limited time for learning. This shows that it turns out that students are very interested and enthusiastic about practicum activities.

Therefore, it is necessary to make maximum efforts so that teachers and students are able to empower and develop science process skills. The hope is that from this practicum learning process, students will be more dominant when participating in learning and developing the abilities that exist in them. Students get direct experience and can critically understand the process of knowledge obtained because this is something that is very important for students to have for the future.

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