

# The Profile of Students' Communication Skills on Science Learning in Elementary Schools

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## ABSTRACT

Communication skills are crucial in 21<sup>st</sup> century education since they encourage other skills, such as speaking skills, critical thinking, and creative thinking. Communication skills are a means to create, maintain, and expand knowledge in science learning. This study explores the profile of students' communication skills in science learning in elementary schools. A qualitative approach was employed. The subjects were 100 public elementary school students in Central Java, Indonesia. Data collection techniques were observation and interviews with students attending science learning classes. The data were analyzed using interaction analysis consisting of data reduction, data presentation, and drawing conclusions. The result revealed that students' communication skills in science learning were poor, with an average score of 1.96 or 49.02%. Answering the question was the indicator frequently found. It had an average score of 2.3 or 57.60%. Meanwhile, the indicator hardly found was asking the question since the average score was 1.64 or 40.93%. Considering the results, the teachers need to apply various materials or an innovative learning model to improve students' communication skills in science learning.

**Keywords:** Communication skills, science learning, elementary school students

## INTRODUCTION

The 21<sup>st</sup>-century skills enhance students' understanding through the digital literacy era. These skills also emphasize essential assistance in training and life skills, which require support, self-direction and competition, capability and accountability, cross-cultural and social skills, and responsibility and leadership (Ichsan et al., 2020; Salimi et al., 2020). One of the 21<sup>st</sup>-century skills that must be taught explicitly is communication skills.

These skills are important in the 21<sup>st</sup>-century, so students should be familiarized with good communication (Ibrahim et al., 2019). A positive communication environment allows them to learn how to communicate to have good communication skills (Yusof & Halim, 2014). Students' communication skills are honed when they conduct discussion sessions (Setyorini et al., 2019). These activities during the discussions can increase students' emotional and social maturity and intellectual abilities (Brownell et al., 2013).

Communication skills are also inseparable from speaking and listening skills as part of language literacy. The communication process involves verbal and nonverbal components designed to mediate student and teacher behavior (Muste, 2016). Chung et al. (2016) also expressed that communication in the learning process builds relationships or interactions between teachers and their students who share thoughts, knowledge, and understanding. In other words, communication is essential in transferring knowledge and exchanging ideas.

In science learning, communication skills are crucial in supporting interaction activities with people or the environment. Natural science discusses the facts of nature or the science of life and the science of the physical world. Natural

science is developed based on studies searching for answers (Chaisson, 2014). In addition, science learning emphasizes direct experience to develop competencies so that students can explore and understand the natural environment scientifically. Science communication skills also include making tables, graphs, charts, essays, reports, and communicating an idea orally and in writing (MacArthur et al., 2017).

Moreover, education is directed at finding and doing something to help students understand their natural surroundings. In science learning, students must master the skills in communicating science because, by having good science communication skills, one can express ideas, opinions, and information obtained through scientific activities both orally and in writing correctly, and information can be well received by listeners (Sari, 2020).

However, most students still lack communication skills. Learning in the classroom is passive because most class interactions are limited to teachers and students, and the teachers lack socialization in teaching (Brownell et al., 2013).

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**How to cite this article:** Angganing P, Budiningsih CA, Haryanto (2022). The Profile of Students' Communication Skills on Science Learning in Elementary Schools. Pegem Journal of Education and Instruction, Vol. 13, No. 1, 2022, 117-124

**Source of support:** Nil.

**Conflict of interest:** None.

**DOI:** 10.47750/pegegog.13.01.14

**Received :** 20.04.2022

**Accepted :** 07.07.2022

**Published:** 01.11.2022

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In the learning process, students seem dependent on seeking information (Bramhall, 2014). The low communication skills in science learning make them experience difficulties and take a long time to make reports or learning outcomes. Based on Sari's (2020) observations, students still lacked in changing data and could not arrange words in clear and precise language.

In addition, the reading culture that students really need to practice communication skills has faded, and the situation is very concerning. It is supported by Asemanyi (2015), who stated that 90% of students preferred watching movies rather than reading books related to the subject matter. According to Rahman et al. (2019), a survey conducted by NACE (National Association of Colleges and Employees) in 2017 showed that 67.5% of students had low communication skills.

Moreover, today's students prefer to use social media rather than face-to-face discussions. This behavior causes students to become less sensitive, do not care about their environment, and increase their individuality attitude. In fact, low communication skills will trigger new complex problems or cause a lot of miscommunications (Ahmetoglu & Acar, 2016). Lack of communication skills can also affect the ability to process information, difficulty integrating thought and speech, and difficulty adapting to the environment (Spektor-Levy et al., 2009).

Therefore, communication becomes vital in learning natural sciences because, without communication, other people do not know what is planned or will be done. Here, teachers need clear communication for good student understanding and to avoid problems for students during learning. Therefore, this study aims to describe communication skills in natural science learning. Thus, communication skills need to be taught to equip future scientists with written or oral communication skills (Brownell et al., 2013).

### Communication Skills

In general, communication can be defined as the process of exchanging information from people who provide information through verbal and non-verbal methods to people who receive the information. Communication skills are one of the life skills, so the ability to process and generate new knowledge needs to be developed in science learning (Bakić-Tomić et al., 2015). The most common method of communication is verbal using a particular language, which is a two-way process with feedback on the message received (Yusof & Halim, 2014). In addition, communication can be understood as conveying information and understanding together from one person to another.

Effective communication is a two-way process that requires effort and skill from both sender and receiver. Erozkan (2013) suggested that communication is the basis of personal relationships, and effective communication occurs when the message is the same as the one received. The communication skills concept is technical, and students need a certain attitude

to understand the concepts (Asemanyi, 2015). As a course, communication skills expose students to conceptual skills, such as sentence patterns, concord, ambiguity, and others.

Several factors influence communication, including language, emotion, anxiety, fear, differences in understanding emotional levels that exceed the limit, and gender differences (Ichsan et al., 2020). The communication process generally involves four elements: speaker, receiver, communication channel, and feedback. In addition, communication has four main purposes: to inform, instruct, motivate, and persuade. It is also expressed by Rahman et al. (2019) that communication skills are useful for students to identify accurate sources of information, filter information as new knowledge, and make the information as additional knowledge in developing insight. In this study, indicators of communication skills comprise (1) asking questions, (2) answering questions, (3) expressing ideas and (4) responding to ideas (Brown & Edmunds, 2018; Pratiwi et al., 2020).

### Natural Science

Natural science is systematic knowledge and structured by connecting natural material phenomena and based on observations. Learning natural sciences is not only mastering knowledge in the form of concepts, principles, or facts but also an invention. It is supported by the opinion of Tanti et al. (2020) that science as a process/method of inquiry includes observation, measurement, formulating problems, testing hypotheses, collecting data, experimenting, and predicting. Eugene L. Chiapetta & Koballa (2010) also suggested that natural science is related to nature, forming an organized and predictable body of knowledge applied in society. The same thing was expressed by Purbosari (2016) that natural science is the result of the interpretation of the natural world.

Natural science as a process or method of inquiry encompasses ways of thinking, attitudes, and steps of scientific activity to obtain a product, such as observation, measurement, formulating, testing hypotheses, collecting data, experimenting, and predicting. Gagne said that the natural science concepts and principles could only be obtained through a series of scientific processes, such as observing, classifying, describing, communicating, drawing conclusions, making operational definitions, formulating hypotheses, controlling variables, interpreting data, and experimenting (Fugarasti et al., 2019).

### METHOD

This type of descriptive research with a qualitative approach was applied. Descriptive research is a study and understanding process based on a methodology investigating a social phenomenon and human problem (Ekayanti, 2017; Salimi et al., 2021). The subjects were 100 public elementary school students in Central Java, Indonesia. Data collection techniques

were observation and interviews with students attending science learning classes. The data analysis technique applied in this study consisted of various stages: (1) data reduction to determine the research subject to be analyzed, (2) data presentation in the form of a description of the subject's answers equipped with a speech and interview results, and (3) drawing conclusions and performing verification. The communication skill indicators measured in this study included (1) asking questions, (2) answering the question, (3) expressing ideas, and (4) responding to ideas (Brown & Edmunds, 2018; Pratiwi et al., 2020). The reference used referred to Widoyoko and Chen's theory. Meanwhile, the success rate criteria are presented in Table 1.

## RESULTS

This research was initiated by carrying out observation activities for elementary school students in Bendosari Sub-district. This observation activity observed the communication skills of fifth-graders. During the observation, the researchers used an observation sheet containing a description of the indicators of communication skills. The observation results are presented in Figure 1.

Based on Figure 1, students' communication skills consisted of four indicators: asking the question, answering the question, expressing ideas, and responding to ideas. Each indicator had a different percentage. The indicator asking the question was in the lowest position, with a percentage of 40.93%, while the indicator responding to ideas was in the

highest position, with 57.60%. When viewed from the criteria for the success rate according to Widoyoko and Chen, the average percentage listed in Figure 1 (49.02%) was included in the less category because the number was still below 60%. It means that students' communication skills were still relatively low. Meanwhile, the description of each indicator is as follows.

### Asking Question

Communication skills in the aspect of asking questions are abilities interpreted with the characteristics of having the courage to ask something to the resource person as the main informant. These characteristics were used to make each statement in the observation sheet. From the results obtained, the percentage of achievement of communication skills on the asking question indicator was the indicator with the lowest result compared to other indicators. The following presents the frequency distribution of communication skills on the asking question indicator.

The asking question indicator is shown in Figure 2, displaying the results that only 13 students had shown their courage in asking questions (good category). A single student had not met the very good category on this indicator. However, the percentage value differed from that a percentage of 52 students still had not shown their courage to ask questions. This indicator was the lowest indicator of other indicators. Thus, the communication ability on the asking question indicator did not meet the standard, or the category was lacking. The average value obtained only reached 1.64 from the complete achievement of 4. If it was a percentage, it was only 40.93%.

Students with the courage to ask questions will be seen in the classroom or in their environment. An attitude becomes a person's ability to ask for information or explanations from other people or interlocutors. When asking, someone will study knowledge on himself first. This attitude cannot be separated from student life at school or in the community. This attitude aims to improve the quality of the learning process

Table 1. Success Rate Criteria

Criteria	Guidance Level of Success
≥ 90	Very high
80-89.	High
70-79.	Sufficient
60-69.	Low
< 60	Very Low

Source: (Widoyoko, 2016; Chen et al., 2020)

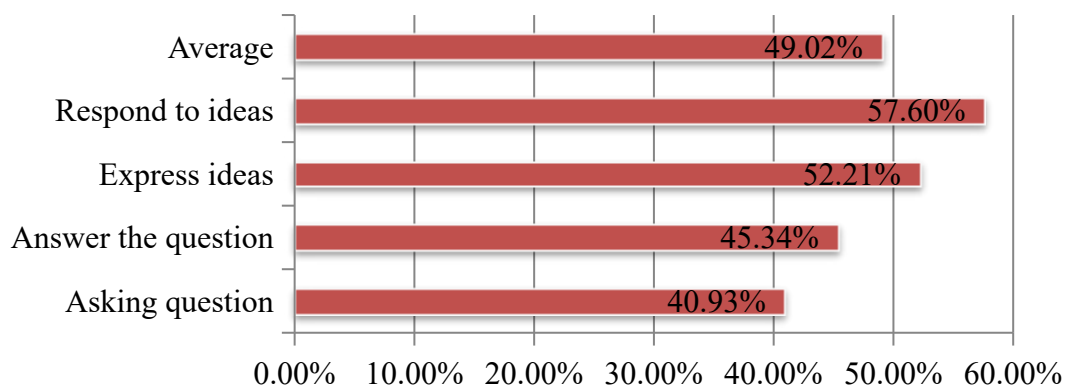


Fig. 1: Percentage of Communication Ability

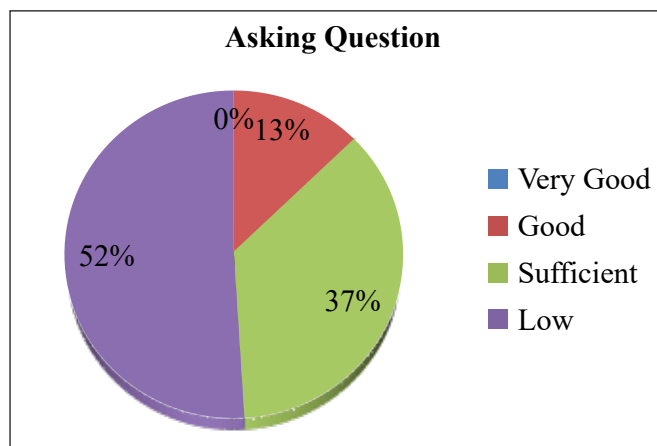


Fig. 2: Percentage of Asking Question Indicators

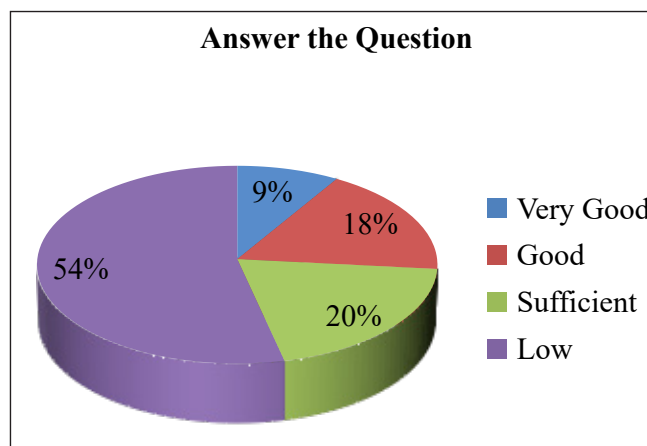


Fig. 3: Percentage of Answering the Question Indicators

and outcomes. In addition, the presence of an attitude of daring to ask questions is part of success in instructional and classroom management. Through this attitude, teachers can detect difficulties in students' thinking processes and improve their learning processes in the future. However, many students still did not dare to ask questions due to several things. The observation results showed that some students were shy and afraid to ask questions. There was also interference from outside, where students were busy talking to their friends and did not listen to the teacher's explanation, so students did not know what they wanted to ask. Another thing is the low critical thinking skills and communication skills of students.

### Answering the Question

Continuing another indicator of communication skills is answering the question. The point is that students' communication skills will be clearly visible when students can answer questions correctly. The distinctive feature of this indicator is that the student could understand the question correctly so that he could answer correctly. In addition to understanding the question, this indicator also appeared in the deepening of students to seek answers to questions. It is an important process so that students get the most appropriate answer. After finding the answer, the student also went through a delivery process that he should arrange himself appropriately. From the observation results, it appeared that the percentage of achievement indicators of the answer the question indicator was 45.34%. Even though the result had almost reached 50%, the category of this figure was still very low. It means that students had not met the answer to the question indicator. The following presents the frequency distribution of communication skills to answer the question indicator.

The results from Figure 3 show that only nine students had answered the questions correctly and in detail, while the other 18 students had answered correctly but not in too much

detail. Some students with a total of 20 had answers close to correct. However, 54 students had not answered the question correctly. In this indicator, few students got the very good category (only nine students). This third indicator identified a problem. Students did not master the questions well. As a result, students' answers had not been maximal. The teacher's questions included three-question items. The question given by the teacher and observed by the first researcher was how the teacher and students demonstrated the steps of the natural science experiment. The next second question that the teacher asked was what the impact was if one of the steps of the experimental activity was missed. The third question was about the student's desire to carry out the experimental activity and the reason. Based on the figure, it can be understood that the communication skills in answering the question indicators were in a low category. The cause of this low indicator was students' lack of knowledge about the water cycle material. Students could not explain the water cycle in detail, so when given verbal questions, students stammered. Students did not understand what the teacher explained, so students could not explain the teacher's explanation again. The lack of students' knowledge of the material given by the teacher impacted the low score of students on the oral test given by the teacher.

### Expressing Ideas

The expressing ideas indicator will be seen when students have the will and are not shy in dealing with other friends in the class. Dare to come forward can also mean daring to appear. This attitude is shown with an attitude of confidence because he has enough courage to appear in front of many people. Shame will disappear if students can trust themselves. Expressing ideas becomes a confident attitude if the child is really not forced to perform. If it is the case, it is not self-confidence. Students are called to express ideas if they accept themselves, consider themselves good, and defend opinions that they think are good. The percentage result obtained was only 52.21%.



Although the value was more than 50%, it could not be said to be good. By looking at the criteria for success, the indicator expressing ideas was still in the low category. The frequency distribution of communication skills on indicators expressing ideas is presented in the Figure 4..

The indicator shown in Figure 4 means that the lack of student courage dominated this indicator to come to the front of the class. In this study, 26 students were in the less category or 26%. Then, only seven students showed their courage came to the front of the class. They were also very confident. Meanwhile, 22 students dared to perform well, and 45 students dared to perform sufficiently well. Indicators expressing ideas included activities to deal with friends in front of the class independently, accepting conditions and other things that the teacher or friends might ask, and restraining himself in front of many people. A striking difference between students who dared to come forward and those who did not dare to be shown when students discussed. Students who dared immediately offered themselves to present the discussion results. Meanwhile, students who did not dare only corner and push their friends to come forward with presentations. The number of students who did not dare to come forward was several reasons. These reasons included students who did not understand the subject matter, were not fluent in reading, were shy, were afraid of being wrong, and were not confident.

### Responding to Ideas

Indicators responding to ideas were categorized as less in percentage. This indicator was marked by the courage of students to answer questions even though the answers given were not perfect. This indicator is also known as one of the characteristics of modern humans. It is because modern humans are characterized by having a sense of self-confidence in their lives. Self-confidence is when individuals dare to develop their potential and show their existence in society. Observation results showed that this indicator only reached

57.60%. This percentage was the highest compared to other indicators. The following presents the frequency distribution of communication skills on indicators responding to ideas.

Indicators responding to ideas can be seen in Figure 5. The meaning of the figure is that 29 students did not dare to answer, and 21 students dared to answer. The rest, 19 students, responded to ideas (good category), and 32 students were included in the category sufficient to have responded to ideas. This indicator was an indicator with the highest results among the others. Even so, this result was not the best because it was still in the low category as a criterion for the success of students' communication skills. It was because students did not master the material perfectly. Students were also less critical in observing the existing conditions, such as not wanting to listen to the teacher's explanation, so they could not answer questions when the teacher asked. Their shyness and fear of not getting the right answer hindered the students' courage to answer questions. If he answered the question incorrectly, the consequence is that the student got embarrassed in front of his friends. It is what students think when asked a question by the teacher.

## DISCUSSION

### Asking Question

Asking questions are important things that students must choose. This type of courage is influential on the success of students in learning. When students do not understand the material explained by the teacher, the main solution is to ask the teacher. Unfortunately, these findings differ from actual expectations. Students have not been maximized on the indicator asking the question. Thus, it is interpreted that students lacked communication skills. This low ability was due to several things. The unpreparedness of students to take lessons is what caused this ability to be not optimal. Laksana (2021) informed that students need initial upgrading

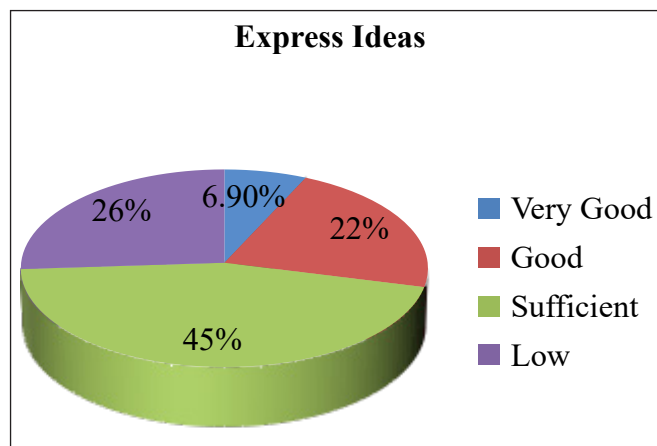


Fig. 4: Percentage of Expressing Idea Indicators

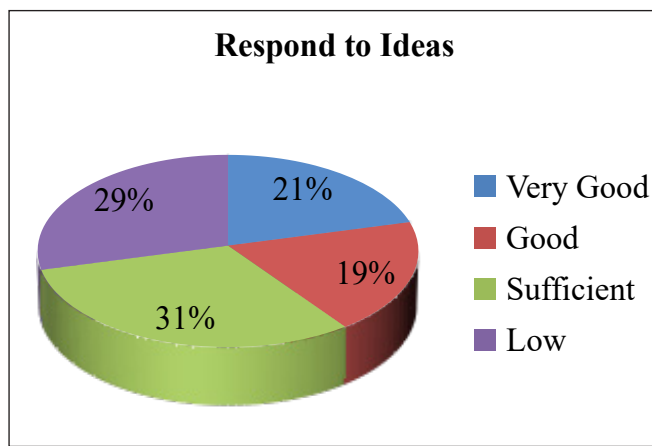


Fig. 5: Percentage of Responding to Idea Indicators

before learning so that students are ready to learn and are not reluctant to ask questions. Here, teachers can motivate by giving rewards if there are students who want to ask. These findings are also in line with Rochmawati & Ridlo (2019) that students' ability to ask questions and engage during learning was still low. Therefore, a tool is needed that can involve students actively in the classroom. The use of this tool or approach leads to the scientific thinking process of students in learning so that it affects the courage of students. It is in accordance with the opinion of Asmoro et al. (2020) that the teacher will meet the courage of students to ask questions after students face difficulties during the process of finding through a learning approach.

On the other hand, the indicator asking the question will appear if there is openness between the teacher and students. According to Hassan et al.'s (2019) findings, students who were not open to something would have difficulty asking questions and could not maximize their communication skills. Basically, communication skills start from what is available in the environment around students.

### Answering the Question

Each indicator of student communication skills did not produce a satisfactory percentage. The same thing with other indicators caused it. The low knowledge of students was the main cause of this problem. According to Swidan et al. (2018), older children will have the opportunity to answer questions correctly compared to younger children. They can explain the reasons for the answers they choose, in contrast to young children who tend to have difficulty answering questions correctly. In line with this finding (Cooper et al., 2018; Fratiwi et al., 2020), it was found that all students in Newton's Law and natural science lessons could not answer the questions correctly. Not only students but higher education levels, such as college students, were also not ready and able to answer questions properly (Kalyani et al., 2019). The inability of students to answer questions correctly would affect student learning outcomes. As found (Khan & Khan, 2019), the inability of students to explain answers correctly affected student scores. In addition, when students answered questions correctly, the score they got would improve so that students would not fail. In fact, Yang et al. (2020) found that many students still tried to repeat the test after failing to answer the questions correctly.

### Expressing Ideas

The next indicator was expressing ideas, with a low success rate. In this study, the courage to come forward or in front of friends was not easy. No wonder the success rate was still below enough. The lack of results was influenced by various factors, such as students who did not understand the subject matter, were not fluent in reading, were shy, were afraid of being

wrong, and were not confident. As explained in the previous indicator, a lack of understanding of the subject matter greatly affected students' ability to deliver answers. It was not much different from this indicator. If students did not know what would be conveyed by him in front of their friends and teachers, they might that students did not dare to come to the front of the class. In line with this study, Hamzah et al. (2020) found that some students still did not dare to come to the front of the class because they were embarrassed or for other reasons. Some students were also embarrassed and afraid to come forward because of their minimal understanding of the material. It aligns with previous findings that some students are afraid of certain subjects, so students are reluctant to come to the front of the class (Arum & Amir, 2016). Again, students' lack of confidence was the main cause of not daring to come forward. Similar findings to this study were also explained by Kaharuddin (2019) that students felt shy and afraid to ask questions, express ideas, and answer questions, and only a few students dared to come forward to work on questions in front of the class. This result certainly indicates the low level of student's communication skills.

### Responding to Ideas

Responding to ideas is one of the important indicators of communicating. It is an ability that involves other aspects such as attitude to be fulfilled. However, the achievement of this indicator was still not optimal. Many factors caused these results. Of course, the courage to answer questions is based on the importance of self-confidence in students. If there is no self-confidence, students may never want to say a word when asked by the teacher. Confidence is defined as the belief that students have to do something until it is successful (Djehiche, 2016). Self-confidence is related to one's success, achievement, peace, and well-being (Perkins, 2018). Students' courage to answer questions can also be maximized after increasing self-confidence and has been shown to affect many things, for example increasing student participation, developing interest in learning, reducing anxiety, creating comfort, and opening up opportunities for sharing opinions in class (Akbari & Sahibzada, 2020). In addition, the courage to answer questions is also strengthened by the student's mastery of the content of the lesson he is studying. The measurement of students' level of understanding can be known by asking students questions (Hendriana et al., 2018). With the courage to answer questions, the teacher can assess how far the students' understanding and communication skills are.

Students were also less critical in observing the existing conditions, such as not wanting to listen to the teacher's explanation. As a result, students could not answer questions when the teacher asked. Students' critical thinking skills are also, in fact, related to the process of giving answers to students. Students must dare to think critically to respond to

information (Mashami & Gunawan, 2018). Another obstacle arose from the students' fear and shame. They worried that the answers they gave were wrong. This attitude could be caused by new students who would accept the concept at the end of the lesson. As a result, they lack experience and understanding. In addition, the assignments received by students were also not based on higher-order thinking. Hence, students were not trained to dare to solve questions from the teacher (answer questions) (Sumarni & Kadarwati, 2020). This finding is consistent with Nur'aini's research (2018) that some students still did not dare to convey their arguments by answering questions given by the teacher.

## CONCLUSION

Overall, the findings of this study produced data that each indicator of communication skills did not run optimally with an average value and a percentage below the standard or low category. These results were due to the low understanding of students in learning, the shame and fear experienced by students, and the low ability of students to think critically and creatively. These findings can be used as a reference for teachers to pay attention to each indicator of student communication skills so that teachers can add and improve indicators of communication skills that are still below standard. In addition, teachers can also refer to this research on the importance of developing communication skills. On the other hand, the recommendation for further researchers is to develop a learning model or approach (for example, a scientific approach and an inquiry model) to improve students' communication skills. Other researchers can also adopt some important concepts regarding communication skills to be used as references to prepare further manuscripts.

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