

## Scientific Communication and Student Interest in Biology Learning through Pictorial Riddle Method

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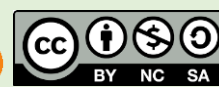
### Abstract

Currently, the main challenge in education is to increase student engagement in science learning. Scientific communication skills are critical skills students need. The use of Pictorial Riddle method is a technique, way or effort made in learning to inform scientific facts for students through images, for example presented in the form of posters, pictures on the blackboard, or projections contained in object transparencies. This study aims to explore how the use of Pictorial Riddle learning method can improve students' scientific communication skills and at the same time arouse their interest in science learning. The method used in this research is a case study, using a sample of 57 students of class XI MIPA selected by random sampling technique. The results showed that the Pictorial Riddle learning method has a good effect on students' interest in science learning where students get learning equipped with pictures on the learner worksheet to be analyzed by students. The Pictorial Riddle approach opens space for student creativity, increases active participation, and strengthens understanding of scientific concepts. This can be the basis for innovative learning approaches, namely with a group learning system to develop scientific communication skills and increase student interest in science learning.

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### Introduction

Communication is a process of sharing knowledge and ideas between two or more people to gain an understanding of concepts. One of the most important things for humans is communication. For humans, communication is a basic need to interact with others in all aspects, one of which is the aspect of education. Communication in education occurs during teaching and learning activities, namely information in the form of material in learning between teachers and students. Teachers act as communicators, and students act as communicators (Urwani et al., 2017).

Student communication is needed in the learning process, including science learning. Science learning directly links students and the environment (Amalia et al., 2018). With this learning, students can use the five senses to understand events in the surrounding environment so that students can think logically and rationally (Prasetyo, 2016). Science learning is carried out to increase student knowledge through an activity that is carried out by formulating problems, processing data and providing solutions to a problem discussed (Iskandar, 2014). Six characteristics must be met or implemented so that science learning can take place properly and effectively, namely as follows: a) The curriculum used must be

relevant to the lives and interests of students, b) The science studied in the classroom has a relationship with the broader community, c) Students should be actively involved in raising scientific questions, ideas, and evidence, d) Students are expected to develop and expand concepts from their own understanding, e) Learning assessment is not only based on results but on the contribution or activeness of students when participating in learning, and f) Improve science learning activities using information and communication technology (Nana & Pramono, 2019).

In science learning, communication is needed because it is very important to interact between people (Hacicaferoğlu, 2014). Communication that plays a role in science learning is scientific communication that can generate student activeness in the science learning process (Fahradina et al., 2014). In this case, the teacher plays a role so students actively participate in learning. Teachers can use the question-and-answer method so that students can interact actively in learning (Priyanto & Kock, 2021). Good scientific communication skills will create a good understanding of concepts for students (Kulsum & Nugroho, 2014). Upper-level classes generally have better scientific communication skills than lower-level classes (Ihmeideh et al., 2010).

Scientific communication requires the ability to speak clearly. The words used must be expressed correctly and straightforwardly to prevent misunderstanding of meaning. In scientific communication, there is a definition of the words used. This is done so that communicants do not interpret or give definitions that are different from the actual meaning. If this happens, it will result in a different thought process (Nana & Pramono, 2019).

Interest is a sense of preference and attachment to a particular activity. Students are interested in learning, influenced by the teacher and subjects that students do not like (Fatonah et al., 2020). The use of learning media can affect students' interest in learning. Media can be a component of active learning strategies such as group discussions or case studies (Fernandez et al., 2021). Learning will be more interesting if the appropriate method attracts students' attention. In addition, teachers must bring technology into the classroom so that students can be directly involved. One of them is the Pictorial Riddle method.

The Pictorial Riddle method is a technique, way, or effort made in learning to inform students of scientific facts through images, for example, presented in the form of posters, pictures on the blackboard, or projections contained in object transparencies. The Pictorial Riddle technique can develop student activity during the learning process by presenting problems in the form of illustrations. The application of this method uses media in the form of images or demonstrations of the actual situation. The Pictorial Riddle method can provide opportunities for students to solve problems, analyze, prove, and draw conclusions independently through pictures, demonstrations, or illustrations of the actual situation; therefore, students get more motivation and increase confidence to express or give opinions in the learning process (Widyanti et al., 2020). So, it can be said that the pictorial riddle technique is a learning technique used to display a problem through images or illustrations that can develop activeness, increase learning motivation, and improve science process skills.

In the research Sugianti et al., (2015), the application of an inquiry learning model based on the pictorial riddle method has a positive influence on students' scientific communication skills with strong catogeri Communication and Student Interest in Science Learning through Pictorial Riddle learning method became the background of research conducted in class XI MIPA at SMAN Serang City, Banten Province. Thus, the study aimed to determine students' communication and learning interest in class XI MIPA at SMAN Kota Serang in science lessons with Pictorial Riddle method.

## **Methods**

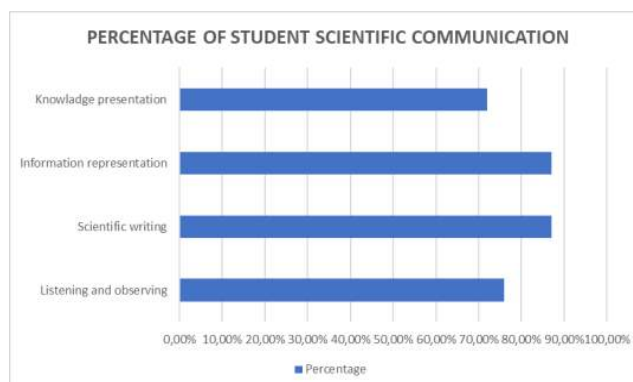
The research method used in this research is case study research by exploring information about students' scientific communication skills and students' interest in science. This research was conducted in one of the public high schools in Serang City. The research respondents were grade XI students in the odd semester of 2023/2024. The sample used in this study was 57 students selected by random sampling technique. The data collection technique uses instruments with indirect communication techniques (non-test) and a collection tool, namely, a questionnaire. Supporting data for this study, apart from the student response questionnaire, is also seen from the student activity sheet (Assyakurrohim et al., 2023).

## **Results and Discussion**

Data on students' scientific communication and students' interest in science were analyzed using descriptive statistical analysis. This analysis described the characteristics of Students' Scientific Communication and Students' Interest in Science in grade XI students in one of the State High Schools in

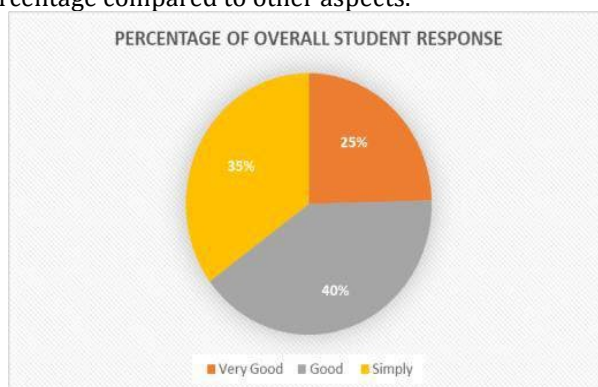
Serang City. The analysis is presented in the form of an average of each aspect and statement and the overall student response. The results of data processing of the assessment of Student Scientific Communication and Student Interest in Science in learning grade XI biology in one of the State High Schools in the city of Serang on the material Structure and Function of Tissues in Plants and Animals using the Pictorial Riddle Learning model.

In the assessment of Student Scientific Communication using an observation sheet consisting of 4 aspects, namely Listening and Observing, Scientific Writing, Information Representation and Knowledge Presentation.



**Figure 1. Percentage of Student Response on Each Aspect**

Figure 1 shows that the Information Representation and Scientific Writing aspects have the same high percentage of 86.55%, which means that the level of student ability in both aspects is very high. The Knowledge Presentation aspect has a percentage of 72.51%, which means that students have a high level of ability in this aspect. Listening and observing has a percentage of 76.02%. It is known that students have a very high level of ability in this aspect. From the calculation results, it can be concluded that Knowledge Presentation has a low percentage compared to other aspects.

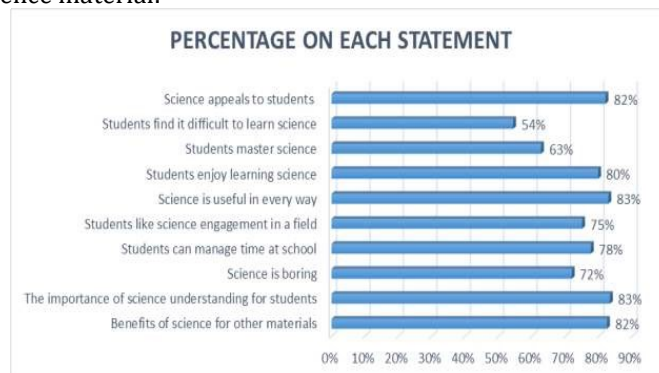


**Figure 2. Percentage of Overall Student Response**

Of the 57 students, the percentage results were 25% with Very Good criteria, 40% with good criteria and 35% with Fair criteria. With these data, it can be concluded that the Pictorial Riddle learning method has a good effect on student scientific communication because, in learning, students' scientific communication skills are applied, which are triggered by several indicators, namely recording the results of observations, discussing the results of activities based on the concept of material, making the output of observations and conveying the results of the discussion (Sugiarti et al., 2015). Pictorial Riddle consists of several stages, namely identifying problems, observing images, formulating explanations, conducting discovery analysis, and analyzing the findings. With these stages, it can be seen that the pictorial riddle learning model can be used as an effort to improve students' scientific communication, such as at the stage of identifying problems that meet the indicators of discussing the results of activities based on material concepts, this is in accordance with Ratnadi (2019), namely problem identification activities in learning can be done with the discussion method. The image observation stage is a stage that fulfills the indicator of recording the results of observations, in this activity the observed images are recorded as material for student presentations. The stage of formulating an explanation fulfills the indicator of conveying the results of the discussion, in accordance with the research of Winanto and Makahube (2016), namely the delivery of discussion results obtained from the formulation of explanations that have been designed by students. The stage of conducting discovery analysis as one of the stages that fulfills the indicator of making the

output of observation results, in this activity making the output of observation results is done through analysis of the discovery or group discussion.

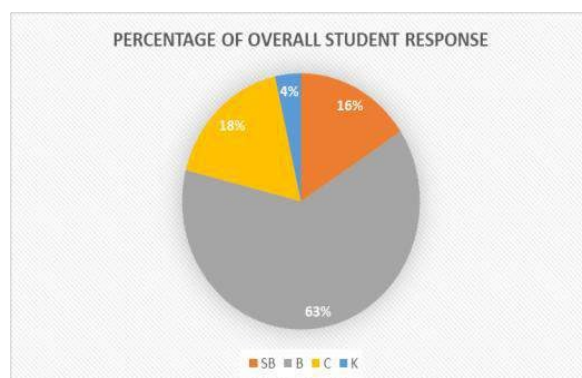
The percentage results are obtained for each statement used based on data processing related to Student Interest in Science. In the statement "Science is Interesting to Students," a frequency of 82% was generated, so it can be concluded that science material is very interesting to students. In the statement "Students Feel Difficulty Learning Science," a frequency of 54% was generated, so it can be concluded that students have difficulty learning science material. In the statement "Students Master Science," a frequency of 63% was generated, so it can be concluded that students master science material. In the statement "Students Enjoy Learning Science," a frequency of 80% was generated, so it can be concluded that students are pleased to learn science material.



**Figure 3. Percentage of Student Response to Each Statement**

In the statement "Science is Useful in All Ways," a frequency of 83% was generated, so it can be concluded that science material is very useful for students in all ways. In the statement "Students Like Science Involvement in Things," a frequency of 75% was generated, so it can be concluded that students like science involvement in things. In the statement "Students Can Manage Time at School," a frequency of 78% was generated, so it can be concluded that students can manage time very well at school. In the statement "Science is Boring," a frequency of 72% was generated, so it can be concluded that science material is boring for some students. In the statement "The Importance of Understanding Science for Students," a frequency of 83% was generated, so it can be concluded that understanding related to science is very important for students. In the statement "The Benefits of Science for Other Materials," a frequency of 82% was generated, so it can be concluded that science is very useful for students for other materials.

Based on the calculation results, it was obtained that the value of 80 was 6 students, the value of 82.5 was 4 students, the value of 95 was 2 students, the value of 85 was 5 students, the value of 92.5 was 2 students, the value of 72.5 was 7 students, the value of 77.5 was 6 students, the value of 70 was 6 students, the value of 67.5 was 5 students, the value of 52.5 was 2 students, the value of 75 was 7 students, the value of 65 was 2 students and the value of 62.5 was 3 students. With this data it can be concluded that the percentage obtained is 10% of students scored very well, 79% of students scored well and 11% of students scored less.



**Figure 4. Percentage of Overall Student Response**

Based on the data processing results, about 16% had Very Good criteria, about 63% had good criteria, about 18% had Fair criteria, and 2 students or about 4% with Poor criteria. With these data, it can be concluded that the Pictorial Riddle learning method has a good effect on student interest in science learning because students learn with the Pictorial Riddle method equipped with pictures on the worksheet



for students to analyze. This application can attract students' interest and motivation in analytical discussions included in science learning (Qomariya et al., 2018).

## Conclusions and Recommendations

Based on the data processing that has been done, it can be concluded that using the pictorial riddle learning method can have a good effect on students' scientific communication and interest in science. This is because the use of the Pictorial Riddle method on students can open up space for students' creativity through the presentation of problems in the form of illustrations that have been given so that students can be more confident to express their opinions in the learning process to develop activeness, increase learning motivation, and improve science process skills.

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