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An Analysis of Students' Scientific Attitude towards Biology Practice at MAN 1 Situbondo

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Abstract This research aims to investigate the scientific attitude of MAN 1 Situbondo students regarding the biology topic practicum. During the odd semester of 2021/2022, numerous class XII students from the Mathematics and Natural Sciences Department of MAN 1 Situbondo conducted this study. This study's participants were class 12 students at MAN 1 Situbondo. This study is a descriptive quantitative study. Online data collecting on the scientific attitudes of students is conducted by filling out a Google form, using a questionnaire approach or completing a questionnaire. Curiosity, honesty, responsibility, confidence, collaboration, and openness are facets of the scientific mindset utilized in data collecting. The results indicated that the curiosity value of the scientific attitude was 81.3% in the very good category, 71.9% in the good category for honesty, 84.4% in the very good category for responsibility, 81.3% with the good category for openness, 96.9% with the very good category for confidence, and 100% with the very good category for cooperation. Overall, 85.9% of students' scientific attitudes during practical activities in general biology courses were rated as very excellent.

Keywords: Biology, Scientific attitude, Practicum Learning, Education

INTRODUCTION

Building a country requires quality human resources, particularly in the sphere of education. The primary objective of education is to enable students to discover new meanings for what they have learnt (Martin, 1997). In order for students' learning to be relevant, a favorable environment or activity is required. According to Ausubel and Pujiastuti (2013), in order to accomplish meaningful learning, each learner must be able to tie new information to already-known relevant ideas or propositions (relationships between concepts). Biology is a science intimately associated with nature. Biology includes pertinent facts, ideas, and propositions (relationships between concepts).

The objective of biology education is to enable pupils to comprehend their natural environment via the process of discovery and action based on direct experience. This will aid pupils in gaining a deeper comprehension. Through the study of biology, it is envisaged that students' scientific attitudes will be further developed, namely in the form of attitudes and values such as curiosity, honesty, responsibility, openness, self-confidence, and cooperation. Practicum is one of the Biology learning activities (Siregat et al., 2022) that might develop scientific mindset.

Every learner is unique in their approach to studying biology (Afriza & Nasution, 2022). Students need to be encouraged to be active in solving issues, thinking critically and creatively in unearthing data, constructing ideas, and applying principles to make them more relevant via the use of practicum as a learning technique. Strengthening the practicum function as a laboratory activity in learning contributes to the consolidation of lecture-presented ideas, one of which was articulated by Dwiyanti (1999), who defined the practicum function as encouraging a scientific mentality. Instilling a scientific attitude via proper learning techniques will have a significant impact on the formation of a favorable attitude toward the studied idea or subject. Therefore, scientific attitudes must be instilled in pupils as early as feasible in order for them to become decent persons and productive future generations (Sukaesih, 2011).

According to Sudijono (2008), attitude is an outwardly radiating symptom or personality trait of human conduct. Thus, an attitude is a behavior or action resulting from a person's response to other individuals or certain things. Aspects of a scientific mentality, namely: curiosity, attitude of wanting to get something new, attitude of collaboration, attitude of not giving up, attitude of not being biased, honesty, responsibility, independent thought, and self-discipline (Harlen in Fakhruddin, 2010).

A scientific attitude is described as the inclination, preparedness, or willingness of a person to respond/feedback/ behave in a scientific way and adhere to the accepted requirements (rules) of science. Every person with a scientific mindset has characteristics such as realism, care for the environment, avoidance of generalizations based on observations, and rejection of dogmatic ideas (Anagun & Yasar, 2009).

According to Kartono (2012), scientific attitudes have a significant impact in the discovery of a lesson's concept, and students might generate new ideas while interacting with a symptom. Scientific attitude is the propensity of persons or individuals to act or behave in a scientific manner while addressing an issue (Sukaesih, 2011).

METHOD

This method of investigation is a quantitative descriptive study that may offer an objective image of students' scientific views on Biology topic practicum using the most recent data. During the odd semester of 2021/2022, numerous class XII students from the Mathematics and Natural Sciences Department of MAN 1 Situbondo conducted this study.

Six factors comprise the scientific attitude of students: (1) curiosity, (2) honesty, (3) responsibility, (4) openness, (5) self-confidence, and (6) cooperation. Utilizing a questionnaire method or filling out a questionnaire, data on students' scientific attitudes is gathered online through the Google form, i.e., by using a questionnaire technique or filling out a questionnaire. Quantitative descriptive analysis, which tries to describe scientific attitude data, was used to analyze the data. Table 1 displays the intervals and categories of students' scientific attitudes.

Table 1. Category of students' scientific attitude values

No	Value intervals (%)	Category
1	80 – 100	Very good
2	66 – 79,9	Good
3	56 – 65,9	Enough
4	40 – 45,9	Poor
5	<40	Very poor

FINDINGS AND DISCUSSION

The results of observing the scientific attitude of students in the biology course practicum can be seen in Table 2.

Table 2. Student's scientific attitude towards biology practicum

No	Aspect	Mean Percentage	Description
1	Curiosity	81,3	Very good
2	Honesty	71,9	Good
3	Responsibility	84,4	Very good
4	Openness	81,3	Very good
5	Self-confidence	96,9	Very good
6	Cooperation	100	Very good
	Total	85,9	Very good

Based on the data in the table, the average proportion of students with scientific attitudes throughout their Biology practicums is 85.9%, which is rated as excellent. This suggests that the implementation of Biology practicums helps encourage scientific attitudes among students. The indication with the greatest average percentage of students is collaboration, with an average percentage of 100, while the indicator with the lowest average scientific attitude is honesty, with an average percentage of 71.9.

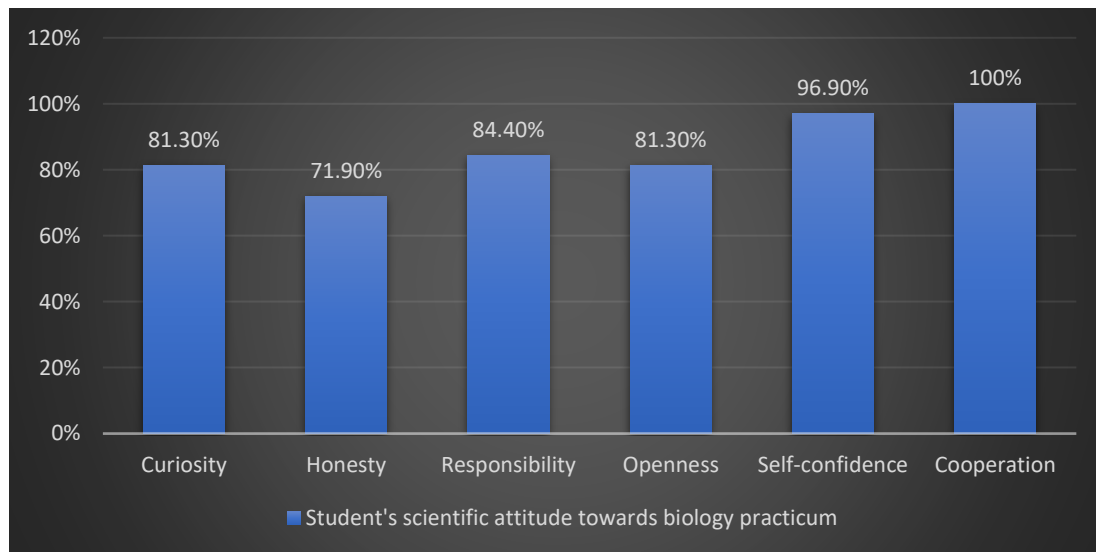


Figure 1. Student's scientific attitude towards biology practicum

Based on Figure 1, it can be seen that the indicator of scientific curiosity in student attitudes receives an average score of 81.3% in the very good category, students appear enthusiastic when asking questions of fellow practitioners during practicum presentations, and a number of students ask the supervising teacher numerous questions about the material and how the Biology practicum operates. The attempts that students make to comprehend a new idea in practicum demonstrate the students' intense interest. In accordance with Yunita's (2012) perspective, the scientific attitude of students may be gauged by their ability to comprehend a new idea with their skills without any trouble, their skepticism about an issue that has to be proved accurate, and their evaluation of their own performance. According to Kartono (2012), curiosity is an attitude and behavior that constantly seeks to gain a deeper and broader understanding of anything learnt, seen, or heard.

The honesty indicator receives an average of 71.9% in the excellent category. When completing tests before to practicums, some students copy or consult other practitioners for answers, but in general, students complete quizzes independently. During the period of practical observation, several groups replicated images or findings acquired by other groups.

Indicator of responsibility scoring an average of 84.4% in the very excellent category. Students are always accountable for every practicum activity, beginning with borrowing tools and materials by the picket group, distributing tools and materials, bringing practicum items according to the assistant's instructions, and cleaning the laboratory at the conclusion of the practicum. Every student must possess and develop a sense of responsibility in order for learning to go effectively and without difficulty. Several components of a scientific mentality may be cultivated and implanted in pupils, including a responsible attitude, as stated by Sardinah et al., (2012). According to Mudalara (2012), throughout the learning process, students must be able to assume complete responsibility for the learning process, with the teacher's role in learning consisting mostly of providing advice and direction when necessary.

When group conversations were not entirely dynamic, the open indicator achieved an average score of 81.3% in the very excellent category. Some groups just agreed with or followed the discussion. Regarding accepting criticism/suggestions from group members, there were those who did not react properly or with grace since they believed the findings collected at the time of observation to be the most accurate.

The average confidence indicator's value of 96.9% is excellent. Numerous practitioners voiced their thoughts on the ideas or steps surrounding the practicum, and some of them felt humiliated and terrified of being incorrect if they spoke their opinions or answered the practicum assistant's inquiries.

The collaboration indicator has an average value of 100 percent, which places it in the very excellent category; this can be seen throughout the practicum process, as all groups engage in practicum observations and play an active role. Each group does their practicum according to the phases of the scientific method. According to Vygostky in Rustaman (2005), students may carry out the phases of the scientific method in groups while studying.

During the learning process, a scientific attitude is established; elements of a scientific attitude include a curious attitude, a critical attitude, an objective attitude, an attitude of collaboration or respect for the work of others, and a conscientious attitude (Yuliani et al., 2012). Throughout the practicum process, the instructor or teacher's aide should develop and nurture scientific attitudes in students, such as curiosity, collaboration, self-confidence, responsibility, openness, and cooperation. Because learning needs students' direct participation in scientific activities, practicum-based education may cultivate scientific attitudes in students (Sukaesih, 2011).

According to Wahyudi (2011), scientific attitudes significantly impact student success. Theoretically, pupils with a strong scientific mindset will be accurate, inquisitive, trustworthy, and diligent learners. So that pupils with a positive scientific attitude would also have great academic accomplishment.

CONCLUSION

The value or percentage of students' scientific attitude on the curiosity indicator is 81.3% in the very good category, the honest attitude indicator has a value or percentage of 71.9% in the good category, the sense of responsibility indicator has a value or percentage of 84.4% in the very good category, the indicator a sense of openness has a value or percentage of 81.3% in the very good category, the indicator confidence has a value or percentage of 95.9% in the very good category, and the indicator Overall, 85.9% of students' scientific attitudes fall under the "very good" category. Therefore, it can be stated that students at MAN 1 Situbondo have an excellent scientific mindset while engaging in practical activities in biology classes.

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