Application of Three-Tier Test for Identification of Misconception Student Quantity on Magnetic Pole

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Keywords:	ABSTRACT
Three-Tier Test, Quantity of Students with Misconceptions, Misconceptions, Magnetic Pole	*This study aimed to identify the quantity of students who have misconceptions about magnetic poles. This research was a descriptive quantitative study with purposive sampling as the sampling technique. The instrument used was a three-tier test, which is to identify the quantity of students with misconceptions. The results of the study showed that there is the highest misconception that a larger magnetic attraction is stronger than a small magnet. It is hoped that the results of this study can be used as a reference for further research and find solutions to these misconceptions.*

INTRODUCTION

Tayubi (2005: 5) stated that concepts are objects, events, situations, or characteristics that have distinctive characteristics and are represented in each culture by an object or symbol. Having a concept can make it easier for humans to communicate with each other and that allows humans to think. According to the Big Indonesian Dictionary (KBBI), a concept is a mental image of an object, process, or anything that exists outside of language, which is used by the mind to understand other things.

Yuliana, Karyanto, & Marjono (2013: 46), stated that conception is a student's interpretation of a particular scientific concept. Interpretation between individuals and other individuals will be different, this is due to differences in capturing information during learning. Suparno (2005: 5) defined conception as the ability to understand concepts, both those obtained through interaction with the environment and concepts obtained from formal education. The ability to understand this concept is important to be mastered by students because this is a basis or prerequisite for students in solving science problems, especially physics (Sari & Sumarli, 2019).

Suparno (2005: 35) stated that before attending a formal class, students already have preconceptions or initial concepts about a concept. Students' preconceptions tend to contain misconceptions. These misconceptions can come from parents, friends, and the environment. Students' preconceptions show that their thinking continues to be active in understanding something (Rosdianto, Murdani, & Hendra, 2017). The purpose of this study is to identify the quantity of students who have misconceptions about magnetic poles.

LITERATURE REVIEW

Misconception
According to Kurniawan and Suhandi (2015: 314), the misconception is a failure to connect or explain events around them with their concept of ideas. According to Muliyani and Kaniawati (2015: 717), misconceptions can be referred to or seen in concepts that are incompatible with scientific concepts. Suhendi et al. (2014: 206), the term misconception is related to student conceptions that are different from generally accepted scientific conceptions. According to Taslidere (2013: 273-282), misconceptions occur in students' unscientific concepts. Based on the understanding that has been described by previous researchers, it can be concluded that a misconception is a mistake in understanding an inaccurate concept of learning material, which can cause a mismatch between personal concepts and scientific concepts. The results of Suparno's research (2005: 145), the forms of misconceptions found in students are: 1) magnetic poles that are similar to neutral, and 2) magnetic bars that are cut into two parts, one part will be the north pole and one part will be the south pole

Three-TierTest
Muliyani and Kaniawati (2015: 717) stated that the three-tier test is one of the diagnostic tests used to identify misconceptions and conceptual understanding. Kurniawan, Suhandi, and Hasanah (2016: 2) stated that the three-tier test is useful for finding out students' wrong answers and misconceptions. The three-tier test has three levels, namely, the first level is a multiple-choice test of knowledge. The second level, students' reasons for choosing answers. The third level is students' confidence in choosing answers (Kurniawan and Suhandi, 2015: 315). The three-tier test can be used by teachers and researchers to find out or uncover misconceptions experienced by students.

METHOD

This type of research used in this research is descriptive quantitative and the results of this study are a description of the number of students who have misconceptions about the magnetic pole material. The population in this study were all students of class X in one of the SMA Negeri Kota Singkawang. The sampling technique in this research is purposive sampling, the technique of determining the sample with certain considerations, namely students who have studied the magnetic pole material. The number of samples in this study amounted to 28 students. There are several decisions in the three-tier test. Table 1 is decisions in the three-tier test adopted from Kurniawan, Suhandi, and Hasanah (2016: 2).

Table 1
Decisions in the Three-Tier Test

Decision	Tier 1	Tier 2	Tier 3
Scientific Concept	Right	Right	Sure
Misconception	Right	Wrong	Sure
Misconception	Wrong	Right	Sure
Misconception	Wrong	Wrong	Sure
Guess	Right	Wrong	Not sure
Guess	Wrong	Right	Not sure
Lucky Guess	Right	Right	Not sure
Lack of knowledge	Wrong	Wrong	Not sure

The use of the three-tier test can make it easier to reveal misconceptions that occur to students. The distribution of data regarding the distribution of misconceptions can be seen in Table 2.

Table 2
Distribution of Misconceptions on Problem

No. Concept	Misconception
1	Magnetic poles are of a neutral type
2	The magnetic bar is cut into two parts, one part will be the north pole and one part will be the south pole

RESULTS AND DISCUSSION

Each student's answer is then analyzed and presented in the following diagram. The percentage of the quantity of students with misconceptions is shown in Fig. 1.
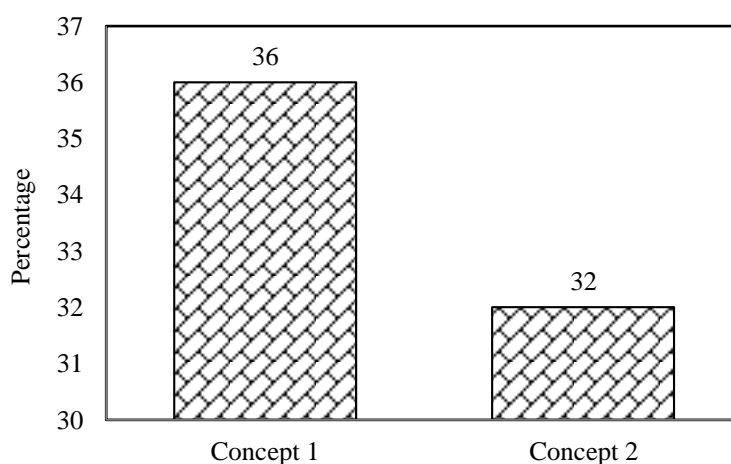

Fig. 1 *Percentage of Student Quantity with Misconceptions*

Based on Fig. 1, the quantity of students with the highest misconception is that in concept 1, a bigger magnetic attraction is stronger than a small magnet. The identification of the quantity of students with misconceptions in this study used a three-tier test. The results of the data analyzed, the percentage of misconceptions in concept 1, namely 36% with the misconception that a larger magnetic attraction is stronger than a small magnet. The percentage in concept 2 is 32% with the misconception that the magnetic bar is cut into two parts, one part will be the north pole and the other part will be the south pole.

CONCLUSION AND SUGGESTION

Based on the results of the data analysis, it can be concluded that the misconception of concept 1 was 36% with the high category of the misconception "the attraction of a bigger magnet is stronger than a small magnet". The concept 2 misconception was 32% with a low category on the misconception "magnetic bars that are cut into two parts, one part will be the north pole and the other part will be the south pole". It is hoped that the results of this study can be used as a reference for further research and find the causes and solutions of these misconceptions.

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