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A Four-tier Test to Identify Students' Conceptions in Inheritance Concepts

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ABSTRACT
Identification of students' conceptions is an important step before developing suitable learning methods to improve students' understanding. One of the best way to identify students' conception is the use of diagnostic test. Therefore, the development of diagnostic tests were important in the teaching and learning process to help the teacher determine the students' conceptions, wheater they have scientific conceptions, lack of knowledge, or misconception. The aim of this research is to develop a valid and reliable four-tier diagnostic test to identify students' conceptions in inheritance. The research method consists of three main stages: define content, obtaine information about students' conception, and develop the four-tier test. The result from the research demonstrated that the four-tier test that was developed, was valid and reliable instrument in diagnosing students' conception in inheritance concepts.

INTRODUCTION

Science is something related to activities that describe, predict, and find explanations for events that occur in the world. The results of science can be represented as an entity that is believed or can be analyzed, called a concept. Concepts that are built in students' minds are obtained from the learning process to make those learning meaningful (Sarwoto et al., 2020). But, everyone has a different understanding concept. Individual understanding of a concepts are referred to a conception. Sometimes, since there are many concepts in science, students write some answers that don't match to the correct concepts (Mimanah et al., 2020). Conceptions can be divided into several categories including understanding scientific conceptions, lack of knowledge, and misconceptions (Kaltakci-Gurel et al., 2017).

The process of identifying and determining the students' profile conceptions can be carried out during learning, because during learning process students are doing an understanding of the concept (Uliyandari et al., 2021)The process involves teacher-developed assesmennts or can be adapted from reliable sources. The diagnose of the students' conception profiles can't be done by using ordinary assesments technique but it can be done by using diagnostic assessment. Diagnostic assesment or usually called diagnostic test is an assessment tool that focus to persistent, recurring, and uresolved learning difficulties (Kaltakci-Gurel, 2015). A diagnostic assement tool is an spesific assessment that can be used to identify the competencies, strengthness, and weaknesses of students so that learning can be designed according to the competencies and conditions of students (Kepmendikbud, 2020). In Kepmendikbud (Decree of the Minister of Education and Culture Republic of Indonesia) Number 719 that was released in 2020 stated that the learning process must begin by giving a diagnostic test hence the teacher can develop the best learning methods or strategies.

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