

DEVELOPMENT OF PHYSICS TEST INSTRUMENTS TO MEASURE MULTI-REPRESENTATIONS ABILITY OF HIGH SCHOOL STUDENTS ON LINEAR MOTION CONCEPT

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ABSTRACT

This study focuses on developing a multiple representation based two tier multiple-choice test to measure physics representation skill on linear motion. The purposes of this study are 1) to determine the construction of a multiple representation based two tier multiple-choice test to measure physics representation skill on linear motion, 2) to determine the feasibility of a multiple representation based two tier multiple-choice test to measure physics representation skill on linear motion, and 3) to determine the characteristics of the physics representation skill used owned by respondents on linear motion.

The development of this instrument was carried out using the modified development method of the Wilson, Oriondo, and Antonio development models. The items were tested on 301 students in five schools in Central Java Province and Yogyakarta Special Region. Item content validity was given to three experts and analyzed using the Aiken's method. As for the item analysis of the instrument using the PCM 1 PL method with the help of Quest. The multi-representation ability of students was analyzed with the help of Quest which was then analyzed further using descriptive statistics.

The results of this study were in the form of a multiple representation based two tier multiple-choice test to measure physics representation skill on linear motion consisted of 20 two-tier multiple-choice questions. These items are valid, fit the PCM 1 PL model, have very good reliability with a score of 0.84, and have a good level of difficulty. Based on the results of the analysis, respondents who took the test trial had low physics representation skills in terms of their ability to represent in various forms of representation and their ability to translate between representations. The results of item analysis and student ability analysis showed that the instrument developed was effective in measuring the physics representation skill on linear motion.

Kata Kunci: *two-tier multiple choice test instrument, multi-representation ability, linear motion*