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THE DESIGN AND VALIDATION OF THE FOUR TIER TEST INSTRUMENT FOR ENERGY LITERACY USING THE RASCH MODEL ANALYSIS

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ABSTRACT

The science education curriculum needs to contain content on environmental issues including energy and its use as an effort to equip prospective physics teacher students with knowledge about the importance of reducing the impact of energy use. For this reason, it is important to measure energy literacy knowledge in prospective physics teacher students. This study aims to design and validate a four-tier test instrument to measure the energy literacy knowledge of prospective physics teacher students. The test instrument format used is a four-tier test. This test model has the advantage of being able to capture more accurate information with various answer patterns. The stages of developing this test used the design-based research model which consisted of five stages, namely developing an assessment framework, designing items, developing rubrics, conducting tests, and applying the Rasch Model analysis. The application of the Rasch Model analysis aims to obtain a valid and reliable test instrument with the Item Response Theory (IRT) approach assisted by the Winsteps program. The research method used is a descriptive-exploratory method to describe the results of the development and validation of the Four Tier test to measure Energy Literacy for prospective physics teacher student. The validation of the test was carried out through an assessment by five experts to assess the construct and content of the test instrument. The results of the item validation showed that the questions were acceptable in all aspects. The conclusion is that the test with four-tier format is suitable for identifying the knowledge of prospective physics teacher students about Energy Literacy. The four tier test model in exploring the energy literacy abilities of prospective teacher students can basically also be applied to students at the elementary school, middle school and high school levels. However, the complexity of the content tested needs to be adjusted to the existing curriculum at each level.