

DEVELOPMENT OF THREE TIER DIAGNOSTIC TEST FOR 21st CENTURY SKILLS IN HIGH SCHOOL PHYSICS LEARNING

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ABSTRACT

Technology and science are experiencing rapid development in the 21st century. In line with these developments, students must have 21st-century skills that include critical thinking, creative, communicative, and problem-solving skills. Therefore, the purpose of this study is to develop a three-tier diagnostic test for 21st-century skills in high school physics learning, with details (1) constructing a three-tier diagnostic test instrument for 21st-century skills in high school physics learning: critical & creative thinking skills, (2) determine the quality of the three-tiers diagnostic test instrument for 21st-century skills in high school physics learning, and (3) determine the effectiveness of the three-tier diagnostic test instrument in detecting and diagnosing difficulties in achieving 21st-century for students in high school physics learning.

The development of the three-tier diagnostic test model uses the Wilson model and the Oriono & Antonio model, modified and developed by Edi Istiyono. The stages of developing test instruments are (1) test design, (2) test trials, and (3) assembly tests. The test design stage consists of several stages, namely, (1) determining the purpose of the test, (2) determining the competence to be tested, (3) determining the material, (4) preparing the test grid, (5) writing items, (6) validation of test items, (7) item improvement and test assembly, and (8) preparation of scoring guidelines. The test trial phase is divided into three, namely, (1) determination of the trial subject (High school), (2) implementation of the trial, (3) data analysis. The final stage, namely assembling the test, consists of four steps, namely, (1) assembling the measurement test, (2) implementing the measurement, (3) analyzing the data, and (4) interpreting the measurement results. Content validity was proven by the V Aiken index and criterion validity based on the Infit MNSQ average. Item characteristics were analyzed based on IRT. The function of information estimates' reliability, then interpreted.

The results of this study indicate content validity as evidenced by the V Aiken index and criterion validity based on the Infit MNSQ average. Item characteristics were analyzed based on IRT. Reliability is estimated using the information function, then interpreted. This development research will produce a three-tier diagnostic test instrument that will be used to diagnose the weakness of 21st-century skills of students in high school physics learning.

Kata Kunci: Three Tier Diagnosis Test, Critical & Creative Thinking Skills, Physics High School