

DEVELOPMENT OF HIGHER ORDER THINKING SKILLS COMPLETE PHYSICS OF SHS USING COMPUTERIZED ADAPTIVE TEST AND EFFECTIVENESS APPLICATION

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ABSTRACT

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This research has a general purpose or long term and a special purpose. The general purpose of this study is to make improvements in learning, especially the computer-based physics test using modern test theory by developing the PhysCoTeHOTS-CAT instrument. Specific objectives of research in the first year to: 1) Describe the construction of HOTS test instruments (Higher Order Thinking Skills) complete High School Physics Sub: HOTS Bloomian, HOTS Marzanoian, Problem Solving, Critical Thinking and Creative Thinking PhysCoTeHOTS-CAT valid, reliable and worthy of use to measure the thinking ability of high-grade class X high school students and 2) Examine the effectiveness of PhysCoTeHOTS-CAT application to measure the Physics higher-order thinking skills of Grade X SHS Students.

The research is a development research using 4D research model (Define, Design, Development and Dissemination) developed by Thiagarajan (1974). The research was conducted in several high schools throughout Yogyakarta involving a minimum of 250 students for each subtest. Research phase in the first year is the development of complete HOTS test of High School Physics with CAT. The research stages include: a) design tests, b) test trials, and c) revision and assembly tests. The design stage of the instrument includes: (1) needs analysis, (2) mapping, (3) drawing conclusions, (4) determination of test objectives, (5) determination of competence to be tested, (6) determination of material tested, (7) test lattice, (8) item writing, (9) validation of test item contents by expert. (10) item repair and test assembly, and (11) preparation of Scoring Guidelines with Partial Credit Model (PCM). The experimental stage of the instrument consists of: (1) determination of the test subject, (2) the implementation of the test test (empirical validation), and (3) analyzing the test result data based on Item Response Theory (IRT) with technique: (a) Instrument (goodness of fit), (b) Reliability, (c) Item Characteristic Curve, (d) Index of Difficulties, and (e) Information and SEM Functions, then CAT settings into PhysCoTeHOTS-CAT software and tested limited.

The results show that: 1) HOTS test (Higher Order Thinking Skills) complete Senior High School Physics Sub: HOTS Bloomian, HOTS Marzanoian, Problem Solving, Critical and Creative Thinking developed Physical Grade X based on expert judgment and empirical validation is valid, reliable, and based on information function and SEM the test to be used for setting into CAT to PhysCoTeHOTS-CAT. 2) the application of HOTS Physics Complete test for Grade X SMA with Computerized Adaptive Test (CAT) developed that is PhysCoTeHOTS-CAT to measure higher-order thinking skills in Senior High school physics Grade X easy to apply and effective and is a renewable test media based on modern test theory (IRT) .

Kata Kunci: *HOTS Bloomian, Marzanoian, Problem Solving, Critical and Creative Thinking, Physics, CAT, PhysCoTeHOTS-CAT*