

# PENGEMBANGAN *REASONING-BASED DIAGNOSTIC TEST* MATA PELAJARAN FISIKA UNTUK MENGIDENTIFIKASI KESULITAN BELAJAR DAN MISKONSEPSI SISWA

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## ABSTRAK

Penelitian ini bertujuan untuk : (1) mendeskripsikan karakteristik dari produk instrumen *reasoning based diagnostic test* pada mata pelajaran Fisika untuk SMA, (2) mendeskripsikan bentuk produk butir-butir soal *reasoning based diagnostic test* pada mata pelajaran Fisika untuk SMA, (3) mengidentifikasi kesulitan belajar dan miskonsepsi pada mata pelajaran Fisika menggunakan perangkat *reasoning based diagnostic test* yang telah dikembangkan.

Metode pengembangan produk yang digunakan di dalam penelitian ini adalah *Research and Development* (R & D). Adapun ketentuan-ketentuan/prosedur kerja yang dilakukan melalui beberapa langkah utama yang harus ditempuh dalam mengembangkan tes, yaitu: (1) menyusun spesifikasi tes, (2) menulis tes, (3) menelaah tes, (4) melakukan uji coba tes, (5) menganalisis butir soal, (6) memperbaiki tes, (7) merakit tes, (8) melaksanakan tes, dan (9) menafsirkan hasil tes.

Hasil penelitian ini dapat disimpulkan bahwa: (1) Karakteristik instrumen tes diagnostik yang dikembangkan adalah sebagai berikut. Setiap soal dilengkapi dengan deskripsi tentang kompetensi yang ingin dicapai, dimensi pengetahuan yang diperlukan yaitu faktual, konseptual, atau prosedural, level kemampuan kognitif, *learning continuum*, dan hierarki materi prasyarat. (2) Setiap soal berbentuk pilihan ganda dengan lima alternatif jawaban (*option*) disertai ruang untuk menuliskan alasan dan tingkat keyakinan siswa (%) dalam menjawab. (3) Sebagian besar siswa yang dijadikan subjek penelitian masih mengalami kesulitan belajar, baik di dalam memahami konsep-konsep fisika tertentu maupun penerapan matematika untuk penyelesaian soal fisika. (4) Sebagian besar siswa yang dijadikan subjek penelitian masih mengalami miskonsepsi tentang beberapa konsep fisika terutama yang memiliki hubungan sangat erat, baik secara fungsional maupun kemiripan istilah.

***Key words: reasoning-based diagnostic test, kesulitan belajar, miskonsepsi***

# THE DEVELOPMENT OF *REASONING-BASED DIAGNOSTIC TEST* ON THE SUBJECTS OF PHYSICS TO IDENTIFYING LEARNING DIFFICULTIES AND MISCONCEPTIONS HIGH SCHOOL STUDENT

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## ABSTRACT

This research aims to: (1) describe the characteristics of the product the instrument reasoning based diagnostic test on the Physics Lesson to High School, (2) describe details of products form a matter of reasoning based diagnostic test on the Physics Lesson to High School, (3) identify learning difficulties and misconceptions on the subjects of physics using the reasoning-based diagnostic test that has been developed.

Product development method used in this research is the Research and Development (R & D). As for the provisions/procedure work done through some of the main steps that should be taken in developing the test, namely: (1) arranging a test specification, (2) test write, (3) reviewing the test, (4) conducting trial tests, (5) analyze the details of the problem, (6) fix the test, (7) assemble the test, (8) carry out test, and (9) to interpret the test results.

The results of this research it can be concluded that: (1) The characteristic instrument of diagnostic tests developed are as follows. Each question comes with a description of the competencies to be achieved, the necessary knowledge dimension that is factual, conceptual, procedural, or the level of cognitive ability, learning continuum, and hierarchy matter prerequisite. (2) Any question multiple choice form with five alternative option of answers with space to write down the reasons and confidence level students (%) in reply. (3) Most of the students who were the subject of the research are still experiencing learning difficulties, either in understanding certain physics concepts as well as the application of mathematics to physics problem solving. (4) Most of the students who were the subject of the research are still having a misconception about some concepts of physics, especially those that have a relationship very closely, both functionally and the similarity of the term.

**Key words: reasoning-based diagnostic test, learning difficulties, misconceptions**