

ABSTRAK

Emalia Soraya, NIM 4213121054 (2026). Pengembangan Instrumen Tes Diagnostik *Four-Tier Multiple Choice Reasoning* Terbuka untuk Identifikasi Miskonsepsi pada Materi Momentum dan Impuls di Kelas XI.

Didalam proses pembelajaran, setiap siswa membangun konsep fisika dengan berpikir dari pengalaman pribadi, sehingga membuat pemahaman konsepnya menjadi berbeda-beda. Perbedaan tingkat pemahaman konsep siswa berakibat mengalami kesalahan, sehingga terjadinya miskonsepsi. Miskonsepsi yang dialami siswa harus diidentifikasi sedini mungkin menggunakan tes diagnostik *four-tier multiple choice reasoning* terbuka. Penelitian ini bertujuan untuk mengembangkan instrumen tes diagnostik *four-tier multiple choice reasoning* terbuka dalam mengidentifikasi miskonsepsi dan menganalisis profil miskonsepsi siswa pada materi Momentum dan Impuls. Jenis penelitian menggunakan *Research and Development* dengan desain model 4-D terdiri dari empat tahapan, yaitu *define*, *design*, *development* dan *disseminate*. Subyek penelitian ini sebanyak 15 siswa pada uji coba kelompok kecil di kelas XI F1-B dan 36 siswa pada uji coba kelompok besar di kelas XI F2-A MAN 2 Model Medan. Instrumen yang digunakan dalam penelitian yaitu wawancara, angket dan tes diagnostik. Analisis data menggunakan indeks Aiken's V. Hasil penelitian menunjukkan bahwa: 1) Instrumen tes diagnostik dibuat dalam bentuk tes *multiple choice reasoning* terbuka terdiri dari 4 tingkat yakni opsi jawaban, tingkat keyakinan dalam memilih jawaban, alasan dan tingkat keyakinan alasan pilihan siswa, 2) lembar validasi diberikan kepada tiga validator menunjukkan nilai Aiken's V sebesar 0,74 termasuk kedalam kategori sedang, 3) Instrumen tes diagnostik *four-tier multiple choice reasoning* terbuka terdiri dari 14 soal dinyatakan valid dengan tingkat reliabilitas sebesar 0,76, dan 4) Persentase siswa yang menghadapi miskonsepsi sebesar 55,7%. Hasil analisis data menyatakan bahwa Instrumen tes diagnostik *four-tier multiple choice reasoning* terbuka yang dibuat efektif untuk mengidentifikasi miskonsepsi serta mengetahui profil miskonsepsi pada materi Momentum dan Impuls.

Kata Kunci : Tes Diagnostik *Four-Tier, Multiple Choice Reasoning* Terbuka, Miskonsepsi Fisika, Momentum dan Impuls

ABSTRACT

Emalia Soraya, NIM 4213121054 (2026). Development of a Four-Level Multiple-Choice Diagnostic Test Instrument for Open Reasoning to Identify Misunderstandings about Momentum and Impulse Material in Grade XI.

In the learning process, each student builds physics concepts by thinking from personal experiences, thus making their conceptual understanding different. Differences in students' conceptual understanding levels result in errors, resulting in misconceptions. Misconceptions experienced by students must be identified as early as possible using an open-ended four-tier multiple choice reasoning diagnostic test. This study aims to develop an open-ended four-tier multiple choice reasoning diagnostic test instrument in identifying misconceptions and analyzing students' misconception profiles on Momentum and Impulse material. This type of research uses Research and Development with a 4-D model design consisting of four stages, namely define, design, development and disseminate. The subjects of this study were 15 students in a small group trial in class XI F1-B and 36 students in a large group trial in class XI F2-A MAN 2 Model Medan. The instruments used in the study were interviews, questionnaires and diagnostic tests. Data analysis using Aiken's V index. The results of the study showed that: 1) The diagnostic test instrument was made in the form of an open multiple choice reasoning test consisting of 4 levels, namely answer options, the level of confidence in choosing answers, reasons and the level of confidence in the reasons for students' choices, 2) the validation sheet was given to three validators showing an Aiken's V value of 0.74, which is included in the moderate category, 3) The open four-tier multiple choice reasoning diagnostic test instrument consisting of 14 questions was declared valid with a reliability level of 0.76, and 4) The percentage of students facing misconceptions was 55.7%. The results of the data analysis stated that the open four-tier multiple choice reasoning diagnostic test instrument that was made was effective in identifying misconceptions and knowing the misconception profile on Momentum and Impulse material.

Keywords : Four-Tier Diagnostic Test, Open-Ended Multiple Choice Reasoning, Physics Misconceptions, Momentum and Impulse.