

ABSTRAK

Akum Laksana. Pengembangan e-modul fisika berbasis STEM pada materi fluida untuk meningkatkan hasil belajar siswa di SMA. Tesis. Medan : Program Studi Pendidikan Fisika, Pascasarjana Universitas Negeri Medan, Mei 2025.

Penelitian ini bertujuan untuk menganalisis kelayakan, kepraktisan, dan keefektifan e-modul fisika berbasis STEM yang dikembangkan pada materi fluida di tingkat SMA. Subjek penelitian adalah seluruh peserta didik kelas XI MIPA di SMA Negeri 1 Kutacane. Metode yang digunakan dalam penelitian ini adalah Research and Development (R&D) dengan mengacu pada model pengembangan ADDIE, yang mencakup lima tahap, yaitu: Analysis, Design, Development, Implementation, dan Evaluation. Pengumpulan data dilakukan melalui observasi, angket, wawancara, tes, dan dokumentasi. Instrumen tes yang digunakan terdiri atas 30 butir soal pilihan ganda untuk mengukur hasil belajar siswa, sementara instrumen non-tes meliputi lembar observasi, angket respon siswa dan guru, serta pedoman wawancara. Analisis data dilakukan secara kuantitatif dan kualitatif. Hasil penelitian menunjukkan bahwa e-modul yang dikembangkan memperoleh rata-rata persentase kelayakan sebesar 91% dari para validator, yang termasuk dalam kategori sangat layak. Uji kepraktisan memperoleh nilai sebesar 87%, dengan kategori sangat praktis, dan uji keefektifan mencapai 89%, yang dikategorikan sangat efektif dalam meningkatkan hasil belajar siswa. E-modul fisika berbasis STEM pada materi fluida ini layak digunakan sebagai alternatif bahan ajar untuk mendukung proses pembelajaran di SMA.

Kata Kunci: Pengembangan, E-Modul, Fisika, STEM, Hasil Belajar, SMA.



ABSTRACT

Akum Laksana. Development of STEM-based physics e-modules on fluid material to improve student learning outcomes in high school. Thesis. Medan: Physics Education Study Program, Postgraduate Program, State University of Medan, May 2025.

This study aims to analyze the feasibility, practicality, and effectiveness of a STEM-based physics e-module developed for the topic of fluid dynamics in senior high school. The research subjects were all Grade XI students of the Science Program at SMA Negeri 1 Kutacane. The research employed a Research and Development (R&D) method, following the ADDIE instructional design model, which includes five stages: Analysis, Design, Development, Implementation, and Evaluation. Data were collected through observations, questionnaires, interviews, tests, and documentation. The test instrument consisted of 30 multiple-choice questions designed to assess students' learning outcomes, while the non-test instruments included observation sheets, survey questionnaires, and interview guidelines. The data were analyzed using both quantitative and qualitative approaches. The results showed that the developed e-module obtained a feasibility score of 91% from expert validators, categorized as "highly feasible." The practicality score reached 87%, classified as "very practical," and the effectiveness score was 89%, indicating a "very effective" impact on students' learning outcomes. In conclusion, the STEM-based physics e-module for the topic of fluids is deemed feasible, practical, and effective, and can be used as an alternative teaching material to support learning activities in senior high school physics classes.

Keywords: Development, E-Module, Physics, STEM, Learning Outcomes, Senior High School.

