ABSTRAK

Junija Gisriani, NIM 4193321026 (2023). Pengembangan *E-Modul* Berbasis STEM (*Science, Technology, Engineering, and Mathematics*) Pada Materi Optika Geometri Kelas XI SMA

Penelitian ini bertujuan untuk mengembangkan *E-Modul* berbasis STEM pada materi optika geometri dan menganalisis kelayakan *E-Modul* ditinjau dari tingkat kevalidan, kepraktisan dan keefektifan *E-Modul*. Jenis penelitian yang digunakan yaitu *Research and Development* (R&D) yang mengacu pada model ADDIE. Teknik Pengumpulan data berupa angket kevalidan, respon guru fisika dan peserta didik, serta tes hasil belajar berupa *pre-test* dan *post-test*. Penelitian ini dilakukan melalui tahapan analisis, desain, pengembangan, implementasi dan evaluasi. Subjek penelitian ini meliputi dua dosen fisika sebagai validator, serta guru fisika dan peserta didik kelas XI-2 dan XI-3 SMA Negeri 1 Aek Kuo. Hasil penelitian berupa tingkat kevalidan diperoleh persentase rata-rata 90% dengan kategori sangat valid. Tingkat kepraktisan *E-Modul* memperoleh kategori sangat praktis dengan rata-rata persentasenya 89% pada uji coba respon guru fisika, pada uji coba kelompok kecil 83,8% dan 86,1% pada uji coba kelompok besar. Tingkat keefektifan *E-Modul* diperoleh N-*gain* sebesar 0,71 dan persentase skor N-*gain* didapatkan sebesar 71,2% untuk pertemuan I. Untuk pertemuan II diperoleh N-*gain* sebesar 0,72 dan persentase skor N-*gain* didapatkan sebesar 72,2% yang menunjukkan terdapat peningkatan pada hasil belajar peserta didik yang dilihat dari hasil pre-test dan post-test. Tingkat keefektifan *E-Modul* berbasis STEM termasuk dalam kategori cukup efektif dilihat dari persentase skor N-*gain*. Dengan demikian, *E-Modul* berbasis STEM pada materi optika geometri ini dinyatakan sangat valid, sangat praktis dan cukup efektif.

Kata Kunci: *E-Modul*, STEM, Optika Geometri.

ABSTRACT

Junija Gisriani, NIM 4193321026 (2023). Development of STEM (Science, Technology, Engineering, and Mathematics) Based E-Modules in Geometry Optical Material for Class XI SMA

This research aims to develop a STEM-based E-Module on geometric optics material and analyze the feasibility of the E-Module in terms of the level of validity, practicality and effectiveness of the E-Module. The type of research used is Research and Development (R&D) which refers to the ADDIE model. Data collection techniques include validity questionnaires, responses from physics teachers and students, as well as learning outcomes tests in the form of pre-tests and post-tests. This research was carried out through the stages of analysis, design, development, implementation and evaluation. The subjects of this research included two physics lecturers as validators, as well as physics teachers and students in classes XI-2 and XI-3 of SMA Negeri 1 Aek Kuo. The research results in the form of a validity level obtained an average percentage of 90% with a very valid category. The level of practicality of the E-Module obtained the very practical category with an average percentage of 89% in the physics teacher response trial, 83.8% in the small group trial and 86.1% in the large group trial. The effectiveness level of the E-Module obtained an N-gain of 0.71 and the N-gain score percentage was 71.2% for meeting I. For meeting II the N-gain was obtained at 0.72 and the N-gain score percentage was 72. 2% which shows that there is an increase in student learning outcomes as seen from the results of the pre-test and post-test. The level of effectiveness of STEM-based E-Modules is included in the quite effective category seen from the percentage of N-gain scores. Thus, the STEM-based E-Module in geometric optics material is declared to be very valid, very practical and quite effective.

Keywords: E-Module, STEM, Geometry Optics.