

ABSTRAK

Ezra Elisabet Lingga, NIM 4203121061 (2020), Pengembangan *E-Modul* Berbasis *Technological Pedagogical Content Knowledge* (TPACK) Materi Gelombang Bunyi

Penelitian bertujuan untuk mengembangkan *e-modul* berbasis *Technological Pedagogical Content Knowledge* (TPACK) yang layak, praktis, dan efektif dalam meningkatkan pemahaman siswa pada materi gelombang bunyi dalam pembelajaran fisika. *E-modul* dirancang untuk mengintegrasikan teknologi, pedagogi, dan konten secara optimal, sehingga mempermudah siswa memahami konsep fisika yang abstrak. Pengembangan *e-modul* dilaksanakan melalui penelitian *Research and Development* dengan model 4-D, yang terdiri dari empat tahapan yaitu *define*, *design*, *develop*, dan *disseminate*. Instrumen penelitian mencakup lembar validasi, lembar respon siswa, dan tes kognitif. Lembar validasi diberikan kepada ahli media, ahli materi, dan guru fisika untuk menilai kelayakan *e-modul*. Uji coba dilaksanakan pada siswa kelas XI MIPA 1 SMA Negeri 13 Medan, dengan melibatkan 10 siswa dalam kelompok kecil dan 35 siswa dalam kelompok besar untuk menganalisis kepraktisan *e-modul*. Tes kognitif digunakan untuk mengevaluasi keefektifan *e-modul* melalui hasil *pretest* dan *post-test*.

Hasil penelitian menunjukkan *e-modul* sangat layak digunakan, dengan rata-rata nilai validasi 90,7% dari ahli materi, 90% dari ahli media, dan 100% dari guru fisika. Kepraktisan *e-modul* terlihat dari respon siswa dengan skor 89,3% pada kelompok kecil dan 99,21% pada kelompok besar. Keefektifan *e-modul* terbukti dari peningkatan pemahaman siswa, dengan hasil uji N-gain sebesar 0,67, dari nilai *pretest* 49 menjadi *post-test* 83.

Kata Kunci : *E-Modul, TPACK, Gelombang Bunyi*

ABSTRACT

Ezra Elisabet Lingga, NIM 4203121061 (2020), Development of Technological Pedagogical Content Knowledge (TPACK) Based E-Modules on Sound Wave.

The research purpose to develop e-modules based on Technological Pedagogical Content Knowledge (TPACK) that are feasible, practical, and effective in improving students' understanding of sound wave in physics learning. E-modules are designed to optimally integrate technology, pedagogy, and content, making it easier for students to understand abstract physics concepts. The development of the e-module is carried out through Research and Development research with the 4-D model, which consists of four stages, namely define, design, develop, and disseminate. The research instruments included validation sheets, student response sheets, and cognitive tests. Validation sheets are given to media specialist, content specialist, and physics teachers to assess the feasibility of the e-module. The trial was carried out on grade XI students of MIPA 1 SMA Negeri 13 Medan, by involving 10 students in small groups and 35 students in large groups to analyze the practicality of the e-module. Cognitive tests are used to evaluate the effectiveness of e-modules through pretest and post-test results.

The results of the study show that the e-module is very feasible to use, with an average validation score of 90.7% from material specialist, 90% from media specialist, and 100% from physics teachers. The practicality of the e-module can be seen from the student response with a score of 89.3% in small groups and 99.21% in large groups. The effectiveness of the e-module is evident from the improvement of student understanding, with the result of the N-gain test of 0.67, from a pretest score of 49 to a post-test score of 83.

Keywords : E-Modul, TPACK, Sound Wave