

Fariza Faradillah. 2025. *Pengembangan E-worksheet Terintegrasi PhET Materi Getaran, Gelombang, dan Cahaya untuk Meningkatkan Keterampilan Berpikir Kritis Siswa*. Skripsi, Program Studi Pendidikan IPA, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Trunojoyo Madura. Pembimbing: Badrud Tamam.

ABSTRAK

Permasalahan rendahnya keterampilan berpikir kritis siswa yang diduga disebabkan oleh minimnya bahan ajar yang memfasilitasi eksperimen IPA secara langsung. Penelitian ini bertujuan untuk menghasilkan *e-worksheet* terintegrasi *PhET* yang valid digunakan untuk meningkatkan keterampilan berpikir kritis siswa. Melalui jenis penelitian *Research and Development* (R&D) dengan model pengembangan ADDIE, penelitian ini dilaksanakan di SMP Negeri 4 Kamal tahun ajaran 2024/2025. Penelitian ini menghasilkan *e-worksheet* yang terbukti sangat valid berdasarkan hasil validasi ahli materi sebesar 88,89% dan ahli media sebesar 93,18%. Implementasi menunjukkan hasil keterbacaan sebesar 87,50% dan hasil respons siswa sebesar 85,93% yang keduanya memiliki kriteria sangat baik. Hasil peningkatan keterampilan berpikir kritis siswa mendapatkan rata-rata *N-Gain* 0,62 dengan kriteria sedang. Kesimpulan dalam penelitian ini yaitu *e-worksheet* terintegrasi *PhET* sangat valid digunakan, memiliki keterbacaan dan respons yang sangat baik, serta dapat meningkatkan keterampilan berpikir kritis siswa. Penggunaan *e-worksheet* terintegrasi *PhET* sangat efektif dan inovatif dalam pembelajaran kurikulum merdeka kelas VIII materi getaran, gelombang, dan cahaya.

Kata Kunci: *e-worksheet*, getaran, gelombang dan cahaya, keterampilan berpikir kritis, *PhET*

Fariza Faradillah. 2025. *Development of Integrated PhET E-worksheets on Vibrations, Waves, and Light to Improve Students' Critical Thinking Skills*. Undergraduate Thesis, Natural Science Education Program, Faculty of Teacher Training and Education, Universitas Trunojoyo Madura. Advisor: Badrud Tamam.

ABSTRACT

The problem of low critical thinking skills in students is allegedly caused by the lack of teaching materials that facilitate direct science experiments. This research aims to produce a valid e-worksheet integrated PhET used to improve students' critical thinking skills. The type of this research is Research and Development (R&D) with the ADDIE development model. This research was conducted at SMP Negeri 4 Kamal in the 2024/2025 academic year. The results of the material expert validation obtained 88,89% and media experts obtained 93,18%, both of which were stated with very valid criteria. The readability results at the implementation stage obtained 87,50% with very good criteria. The results of student responses at the implementation stage obtained 85,93% with very good criteria. The results of the improvement of students' critical thinking skills obtained an average N-Gain of 0,62 with medium criteria. The conclusion in this research is that the e-worksheet integrated PhET is very valid for use, has very good readability and response, and can improve students' critical thinking skills. The use of the e-worksheet integrated PhET is very effective and innovative in learning the independent curriculum for class VIII on vibrations, waves, and light.

Keywords: *e-worksheet, vibrations, waves, and light, critical thinking skills, PhET*