

ABSTRAK

Darjika Astu, I Ketut (2026). *Pengembangan E-Modul Interaktif Berbasis Problem-Based Learning untuk Meningkatkan Penalaran Kritis Matematika Siswa Kelas V SD*. Tesis, Program Studi S2 Teknologi Pendidikan, Program Pascasarjana, Universitas Pendidikan Ganesha.

Penelitian ini bertujuan untuk mendeskripsikan proses pengembangan e-modul interaktif berbasis *Problem-Based Learning* (PBL) yang valid, praktis, dan efektif untuk meningkatkan kemampuan penalaran kritis matematika siswa kelas V sekolah dasar. Pengembangan media pembelajaran ini dilatarbelakangi oleh rendahnya kemampuan penalaran kritis matematika siswa yang ditunjukkan oleh kesulitan dalam menganalisis masalah kontekstual serta menarik kesimpulan secara logis. Oleh karena itu, diperlukan media pembelajaran yang kontekstual, interaktif, dan mampu memfasilitasi proses berpikir tingkat tinggi siswa. Penelitian ini merupakan penelitian dan pengembangan (*Research and Development*) dengan menggunakan model ADDIE yang meliputi tahap *Analyze, Design, Development, Implementation*, dan *Evaluation*. Penelitian dilaksanakan di SDN 1 Dajan Peken dengan subjek penelitian terdiri atas ahli materi, ahli media, dan 27 siswa kelas V. Teknik pengumpulan data dilakukan melalui lembar validasi ahli, *User Experience Questionnaire* (UEQ), serta tes pretest dan posttest. Instrumen tes memiliki reliabilitas tinggi sebesar 0,848. Data dianalisis secara deskriptif kualitatif dan kuantitatif menggunakan uji normalitas, *paired sample t-test*, perhitungan N-Gain, dan *effect size* (Hedge's d). Hasil penelitian menunjukkan bahwa e-modul interaktif berbasis PBL yang dikembangkan dinyatakan valid berdasarkan penilaian ahli serta memiliki tingkat kepraktisan yang sangat baik berdasarkan hasil UEQ dengan kategori *Excellent* pada aspek daya tarik (1,91), ketepatan (1,85), stimulasi (1,94), dan kebaruan (1,68). Selain itu, e-modul terbukti efektif meningkatkan kemampuan penalaran kritis matematika siswa secara signifikan ($\text{Sig. } 0,000 < 0,05$) dengan nilai N-Gain sebesar 0,7129 yang termasuk kategori tinggi dan *effect size* sebesar 3,10 yang termasuk kategori sangat besar. Dengan demikian, e-modul interaktif berbasis *Problem-Based Learning* layak dan efektif digunakan untuk meningkatkan kemampuan penalaran kritis matematika siswa sekolah dasar.

Kata kunci: E-modul interaktif, Media pembelajaran digital, Penalaran kritis matematika, Problem-Based Learning, Sekolah dasar

ABSTRACT

Darjika Astu, I Ketut (2026). *Developing Problem-Based Learning-Based Interactive E-Modules to Improve Mathematical Critical Reasoning of Fifth-Grade Elementary School Students*. Thesis, Educational Technology Master's Program, Post-Graduate Program, Universitas Pendidikan Ganesha.

This study aims to develop a valid, practical, and effective interactive e-module based on *Problem-Based Learning* (PBL) to improve the mathematical critical reasoning ability of fifth-grade elementary school students. The development of this learning media is motivated by the low level of students' mathematical critical reasoning, as indicated by their difficulties in analyzing contextual problems and drawing logical conclusions. Therefore, contextual and interactive learning media that facilitate higher-order thinking processes are needed. This study employed a *Research and Development* (R&D) method using the ADDIE model, which consists of the stages of *Analyze, Design, Development, Implementation, and Evaluation*. The research was conducted at SDN 1 Dajan Peken involving material experts, media experts, and 27 fifth-grade students as research subjects. Data were collected through expert validation sheets, the *User Experience Questionnaire* (UEQ), and pretest and posttest assessments. The test instrument showed high reliability with a coefficient of 0.848. The data were analyzed using qualitative and quantitative descriptive techniques including normality testing, *paired sample t-test*, N-Gain calculation, and *effect size* (Hedge's *d*). The results show that the developed PBL-based interactive e-module is valid according to expert evaluation and has a very high level of practicality based on the UEQ results with an *Excellent* category in attractiveness (1.91), efficiency (1.85), stimulation (1.94), and novelty (1.68). Furthermore, the e-module is proven effective in significantly improving students' mathematical critical reasoning ability (Sig. 0.000 < 0.05) with an N-Gain score of 0.7129 categorized as high and an *effect size* of 3.10 categorized as very large. Therefore, the PBL-based interactive e-module is feasible and effective for improving elementary school students' mathematical critical reasoning abilities.

Keywords: Digital learning media, Elementary school, Interactive e-module, Mathematical critical reasoning, Problem-Based Learning