ABSTRAK

Heron (2026), Pengembangan E-Modul Projek IPAS Berlandaskan Tri Hita Karana untuk Meningkatkan Keterampilan Bernalar Kritis Murid Kelas X SMK. Tesis, Pendidikan IPA, Program Pascasarjana, Universitas Pendidikan Ganesha.

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Kata kunci : ADDIE, E-Modul, Keterampilan Bernalar Kritis, *Project-Based Learning*, Projek IPAS, Tri Hita Karana

Keterampilan bernalar kritis merupakan keterampilan esensial yang membantu murid berpikir secara efektif, rasional, reflektif, dan bertanggung jawab. Namun, hasil studi pendahuluan di SMK PGRI 2 Denpasar menunjukkan bahwa keterampilan bernalar kritis murid masih rendah dan belum tersedia bahan ajar digital yang secara sistematis memandu murid belajar melalui aktivitas proyek. Penelitian ini bertujuan menghasilkan e-modul Projek IPAS berlandaskan Tri Hita Karana untuk murid kelas X SMK yang valid, praktis, dan efektif dalam meningkatkan keterampilan bernalar kritis. Penelitian ini menggunakan metode penelitian dan pengembangan (*Research and Development*) dengan model ADDIE (*Analysis, Design, Development, Implementation, Evaluation*). Subjek validasi terdiri atas empat ahli, sedangkan uji kepraktisan melibatkan 12 guru/praktisi dan 34 murid. Uji efektivitas menggunakan desain *Pretest-Posttest Nonequivalent Control Group* yang melibatkan 27 murid pada kelas eksperimen dan 22 murid pada kelas kontrol, dengan data dianalisis menggunakan ANCOVA. Hasil penelitian menunjukkan bahwa e-modul dinyatakan: (1) sangat valid berdasarkan penilaian ahli materi (KVG = 1,00), ahli media (97,14%), dan ahli bahasa (97,87%); (2) praktis berdasarkan respons guru (92,13%), uji perorangan (86,67%), kelompok kecil (93,33%), dan kelompok besar (88,69%); serta (3) efektif, ditunjukkan oleh hasil ANCOVA yang memperlihatkan perbedaan signifikan keterampilan bernalar kritis antara kelas eksperimen dan kelas kontrol setelah skor *pretest* dikendalikan ($p < 0,05$). Rata-rata skor *posttest* kelas eksperimen (84,48) lebih tinggi daripada kelas kontrol (75,32). Dengan demikian, e-modul Projek IPAS berlandaskan Tri Hita Karana tergolong valid, praktis, dan efektif untuk meningkatkan keterampilan bernalar kritis murid kelas X SMK.

ABSTRACT

Heron (2026), Development of an E-Module Based on Tri Hita Karana (THK) to Improve Students' Critical Reasoning Skills in Science Project Learning for Grade X of Vocational High Schools. Thesis, Science Education, Postgraduate Program, Ganesha University of Education.

This thesis has been approved and reviewed by Supervisor I: Prof. Dr. Ida Bagus Putu Arnyana, M.Si. and Supervisor II: Dr. I Nyoman Tika, M.Si.

Keywords: ADDIE, E-Module, Critical Reasoning, Project-Based Learning, Natural and Social Science Projects (Projek IPAS),Tri Hita Karana

Critical reasoning is an essential skill that enables students to think effectively, rationally, reflectively, and responsibly. However, a preliminary study at SMK PGRI 2 Denpasar indicated that students' critical reasoning skills were still low and that digital teaching materials systematically guiding students through project-based activities were not yet available. This study aimed to develop a valid, practical, and effective Tri Hita Karana-based e-module for Grade X vocational high school Natural and Social Science Projects (Projek IPAS) to improve students' critical reasoning skills. This Research and Development (R&D) study employed the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The validation involved four experts, while the practicality test involved 12 teachers/practitioners and 34 students. Effectiveness was examined using a Pretest-Posttest Nonequivalent Control Group Design involving 27 students in the experimental class and 22 students in the control class, with the data analyzed using ANCOVA. The results showed that the e-module was (1) highly valid based on material expert validation (KVG = 1.00), media validation (97,14%), and language validation (97,87%); (2) practical based on teacher responses (92.13%), individual testing (86.67%), small-group testing (93.33%), and large-group testing (88,69%); and (3) effective, as ANCOVA showed a significant difference in critical reasoning skills between the experimental and control classes after controlling for pretest scores ($p < .05$). The mean posttest score of the experimental class (84.48) was higher than that of the control class (75.32). Therefore, the Tri Hita Karana-based Projek IPAS e-module was valid, practical, and effective in improving the critical reasoning skills of Grade X vocational high school students.