

## ABSTRAK

Wilandari, Putu Ayu Desi (2024), *Pengembangan E-Modul Matematika Berbantuan Augmented Reality Melalui Problem Based Learning (Pbl) Untuk Meningkatkan Kemampuan Pemecahan Masalah*. Tesis. Teknologi Pendidikan. Program Pascasarjana, Undiksha.

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Penelitian ini dilatarbelakangi dari kurangnya bahan ajar yang mampu menunjang proses pembelajaran lebih kreatif, menarik, memuat masalah kontekstual serta sesuai dengan kemajuan teknologi abad 21. Penelitian ini bertujuan menghasilkan bahan ajar berupa E-modul Matematika berbantuan *Augmented Reality* yang valid, praktis, dan efektif untuk meningkatkan kemampuan pemecahan masalah matematika siswa. Pengembangan E-modul Matematika berbantuan *Augmented Reality* ini menggunakan model ADDIE yang memiliki 5 tahap yaitu *Analyse, Design, Development, Implementation, and Evaluate*. Data yang dikumpulkan dalam bentuk data kualitatif dan kuantitatif dengan instrumen angket validitas ahli materi dan ahli media dengan teknik analisis *gregory*, angket kepraktisan dengan teknik analisis perhitungan rata-rata, serta tes kemampuan pemecahan masalah dengan teknik analisis data  $\langle gain\ score \rangle$  ternormalisasi dan memenuhi kualifikasi Penilaian Acuan Patokan (PAP) minimal skor 66 kualifikasi baik. Uji efektivitas pada penelitian dilakukan dengan rancangan *pre-experimental one group pre test post test design*. Data yang terkumpul dianalisis menggunakan analisis deskriptif. Hasil penelitian yang diperoleh, yaitu (1) E-modul Matematika berbantuan *Augmented Reality* yang dilengkapi dengan video, audio, kuis interaktif, game dan konten AR. (2) E-modul Matematika berbantuan *Augmented Reality* dinyatakan sangat valid secara keseluruhan dengan nilai rata-rata 92,85. (3) E-modul Matematika berbantuan *Augmented Reality* dinyatakan sangat valid dari segi materi dengan koefisien validasi Gregory 1,00 dan dari segi media dengan koefisien validasi Gregory 1,00 sangat valid (4) E-modul Matematika berbantuan *Augmented Reality* dinyatakan sangat praktis oleh pendidik dan peserta didik dengan nilai rata-rata berturut-turut 90,94 dan 86,00. (5) E-modul Matematika berbantuan *Augmented Reality* dinyatakan efektif meningkatkan kemampuan pemecahan masalah matematika siswa dengan nilai  $\langle gain\ score \rangle$  0,31 dengan kualifikasi sedang. Berdasarkan hasil penelitian, dapat disimpulkan bahwa E-modul Matematika berbantuan *Augmented Reality* telah dinyatakan valid, praktis, dan efektif meningkatkan kemampuan pemecahan masalah matematika siswa.

**Kata kunci** : *e-modul matematika, augmented reality, pbl, pemecahan masalah*

## ABSTRACT

Wilandari, Putu Ayu Desi (2024), Development of a mathematics emodule assisted by augmented reality through problem based learning (PBL) to improve problem solving abilities. Thesis. Education technology Program, Ganesha University of Education.

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This research is motivated by the lack of teaching materials that are able to support a more creative, interesting learning process, contain contextual problems and are in accordance with 21st century technological advances. This research aims to produce teaching materials in the form of Mathematics E-modules assisted by Augmented Reality that are valid, practical and effective for improve students' mathematical problem solving abilities. The development of the Augmented Reality-assisted Mathematics E-module uses the ADDIE model which has 5 stages, namely Analyze, Design, Development, Implementation, and Evaluate. The data collected is in the form of qualitative and quantitative data using material expert and media expert validity questionnaire instruments using Gregory analysis techniques, practicality questionnaires using average calculation analysis techniques, as well as problem solving ability tests using normalized <gain score> data analysis techniques and meeting the qualifications. Benchmark Assessment (PAP) with a minimum score of 66 good qualifications. The effectiveness test in the research was carried out using a pre-experimental one group pre test post test design. The collected data was analyzed using descriptive analysis. The research results obtained are (1) Mathematics E-module assisted by Augmented Reality which is equipped with video, audio, interactive quizzes, games and AR content. (2) The Mathematics E-module assisted by Augmented Reality was declared very valid overall with an average score of 92.85. (3) The Mathematics E-module assisted by Augmented Reality was declared very valid in terms of material with a Gregory validation coefficient of 1.00 and in terms of media with a Gregory validation coefficient of 1.00 very valid (4) The Mathematics E-module assisted by Augmented Reality was declared very practical by educators and students with average scores of 90.94 and 86.00 respectively. (5) The Mathematics E-module assisted by Augmented Reality was declared effective in improving students' mathematical problem solving abilities with a <gain score> 0.31 with moderate qualifications. Based on the research results, it can be concluded that the Mathematics E-module assisted by Augmented Reality has been declared valid, practical and effective in improving students' mathematical problem solving abilities.

Keywords: *mathematics e-module, augmented reality, pbl, problem solving*