

**PENGEMBANGAN MEDIA RANTAI TRANSFORMASI ENERGI  
AUGMENTED REALITY BERBASIS CODING UNTUK MENINGKATKAN  
KEMAMPUAN BERNALAR KRITIS DAN *COMPUTATIONAL THINKING*  
SISWA PADA MATERI IPAS DI SEKOLAH DASAR**

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**ABSTRAK**

Penelitian ini bertujuan untuk mengembangkan media pembelajaran Rantai Transformasi Energi Augmented Reality Berbasis Coding pada materi Energi disalurkan Antar Makhluk Hidup untuk meningkatkan kemampuan Bernalar Kritis dan Computational Thinking siswa kelas V sekolah Dasar yang valid, praktis dan efektif. Penelitian pengembangan ini menggunakan model ADDIE (Analyze, Design, Development, Implementation, Evaluation). Metode dari pengumpulan data menggunakan instrument tes esay. Data dari hasil validitas media bersumber dari ahli media pembelajaran, dan ahli materi. Data dari kepraktisan media bersumber dari hasil respon siswa sebanyak 28 orang siswa. Pengujian untuk mengukur efektivitas produk dilakukan dengan menggunakan metode praeksperimen Hasil dari penelitian ini menunjukkan bahwa: (1) validitas produk yang dihasilkan memperoleh nilai rata-rata untuk media sebesar 0,95 dan materi 0,94, yang mengindikasikan produk tersebut sangat layak digunakan; (2) kepraktisan media berdasarkan uji respon siswa memperoleh skor 93% (sangat baik). (3) uji-t berkolerasi menghasilkan nilai signifikansi (2-tailed) sebesar 0,001 atau  $p < 0,05$ , yang menunjukkan bahwa media Rantai Transformasi Energi Augmented Reality Berbasis Coding mengenai materi Energi disalurkan antar Makhluk Hidup yang valid, praktis, dan Efektivitas dalam meningkatkan kemampuan Bernalar Kritis dan Computational Thinking siswa kelas V SD SD Negeri 1 Penarukan sehingga layak digunakan secara berkelanjutan pada kegiatan pembelajaran.

**Kata Kunci :** Rantai Transformasi Energi, *Augmented Reality*, Bernalar Kritis, *Computational Thinking*, Model ADDIE.

**DEVELOPMENT OF AUGMENTED REALITY ENERGY  
TRANSFORMATION CHAIN MEDIA BASED ON CODING TO IMPROVE  
STUDENTS' CRITICAL REASONING AND COMPUTATIONAL THINKING  
ABILITIES ON SCIENCE MATERIALS IN ELEMENTARY SCHOOLS**

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**ABSTRACT**

*This study aims to develop a learning media for Augmented Reality Energy Transformation Chain Based on Coding on the material Energy is Channeled Between Living Things to improve the Critical Reasoning and Computational Thinking abilities of grade V elementary school students that are valid, practical and effective. This development research uses the ADDIE model (Analyze, Design, Development, Implementation, Evaluation). The method of data collection uses an essay test instrument. Data from the results of media validity are sourced from learning media experts and material experts. Data from the practicality of the media comes from the results of student responses of 28 students. Testing to measure the effectiveness of the product was carried out using the pre-experimental method. The results of this study indicate that: (1) the validity of the resulting product obtained an average value for the media of 0.95 and the material 0.94, which indicates that the product is very feasible to use; (2) the practicality of the media based on the student response test obtained a score of 93% (very good). (3) the correlated t-test produced a significance value (2-tailed) of 0.001 or  $p < 0.05$ , which indicates that the Augmented Reality Energy Transformation Chain media Based on Coding regarding the material Energy is distributed between Living Things is valid, practical, and Effectiveness in improving Critical Reasoning and Computational Thinking skills of grade V students of SD Negeri 1 Penarukan so that it is feasible to be used sustainably in learning activities.*

**Keywords:** *Energy Transformation Chain, Augmented Reality, Critical Reasoning, Computational Thinking, ADDIE Model.*