

ABSTRAK

PENGEMBANGAN PROGRAM PEMBELAJARAN ENERGI TERBARUKAN DENGAN STRATEGI *ENGINEERING DESIGN PROCESS* TERINTEGRASI PjBL-STEM UNTUK MENINGKATKAN KETERAMPILAN *CREATIVE PROBLEM SOLVING* DAN LITERASI NUMERASI

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Penelitian ini bertujuan mendeskripsikan Program Pembelajaran dengan strategi Engineering Design Process (EDP) Terintegrasi PjBL-STEM yang valid untuk menstimulus keterampilan *creative problem solving* dan literasi peserta didik pada topik energi terbarukan, serta kepraktisan dan efektivitas dari program pembelajaran tersebut. Jenis penelitian ini adalah penelitian pengembangan dengan desain ADDIE yang terdiri dari langkah *analyze, define, design, implementation, dan evaluation*. Hasil analisis data menunjukkan Program Pembelajaran yang dikembangkan valid untuk menstimulus keterampilan keterampilan *creative problem solving* dan literasi peserta didik pada topik energi terbarukan dengan persentase 91.8%. Kepraktisan program pembelajaran memperoleh persentase 90% dengan kriteria sangat praktis, dan efektivitas memperoleh *N-Gain* 0.6 dengan kriteria peningkatan sedang. Berdasarkan hasil analisis data yang telah dilakukan, dapat disimpulkan bahwa: 1) Program pembelajaran dengan strategi EDP terintegrasi PjBL-STEM dinyatakan valid secara isi, bahasa, media dan desain berdasarkan hasil penilaian; 2) Kepraktisan Program pembelajaran dengan strategi EDP terintegrasi PjBL-STEM yang ditinjau dari segi keterlaksanaan, kemenarikan, dan keterbacaan, terkategori sangat praktis, sehingga dapat digunakan pada pembelajaran Fisika SMA, Kurikulum Merdeka, Fase E, topik Energi Terbarukan; serta 3) Efektivitas Program pembelajaran dengan strategi EDP terintegrasi PjBL-STEM terkategori sedang, sehingga Program pembelajaran dengan strategi EDP terintegrasi PjBL-STEM dapat menstimulus peningkatan keterampilan *creative problem solving* dan literasi numerasi peserta didik pada topik energi terbarukan.

Kata Kunci: *Creative Problem Solving Engineering Design Process*, Literasi Numerasi, PjBL-STEM, Program Pembelajaran.

ABSTRACT

THE DEVELOPMENT OF A RENEWABLE ENERGY LEARNING PROGRAM UTILIZES ENGINEERING STRATEGIES AND PjBL-STEM INTEGRATED PROCESS DESIGN TO ENHANCE LEARNERS' SKILLS IN CREATIVE PROBLEM-SOLVING AND NUMERATION LITERACY

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This research aims to describe a learning program employing a valid PjBL-STEM Integrated Engineering Design Process (EDP) strategy aimed at stimulating students' creative problem-solving and numeracy literacy skills in renewable energy topics, as well as evaluating the practicality and effectiveness of the program. This type of research falls under development research with an ADDIE design comprising analyze, define, design, implementation, and evaluation steps. The results of data analysis indicate that the developed learning program is valid for stimulating students' creative problem-solving and literacy skills in renewable energy topics, with a percentage of 91.8%. The practicality of the learning program scored 90%, meeting very practical criteria, while its effectiveness yielded an N-Gain of 0.6, indicating moderate improvement. Based on the results of the data analysis that has been carried out, it can be concluded that: 1) The learning program employing the PjBL-STEM integrated EDP strategy is deemed valid in terms of content, language, media, and design based on the assessment results; 2) The practicality of the learning program utilizing the PjBL-STEM integrated EDP strategy, as assessed in terms of implementation, interest, and readability, is classified as very practical, rendering it suitable for use in high school physics learning, the Independent Curriculum, Phase E, Renewable Energy topics; and 3) The effectiveness of the learning program employing the PjBL-STEM integrated EDP strategy is categorized as moderate, indicating its ability to enhance students' creative problem-solving skills and numeracy literacy in renewable energy topics.

Keywords : *Creative Problem Solving, Engineering Design Process, Numeracy Literacy, PjBL-STEM, Learning Program.*