

ABSTRAK

PENGEMBANGAN PROGRAM PEMBELAJARAN BERBASIS *MULTIPLE REPRESENTATIONS* TERINTEGRASI *PjBL* *STEM* UNTUK MELATIH KETERAMPILAN BERPIKIR SPASIAL DAN LITERASI *SUSTAINABILITY* SISWA SMA PADA TOPIK ENERGI TERBARUKAN

Oleh

DENI ANGGRAINI

Penelitian ini bertujuan untuk mendeskripsikan kevalidan, kepraktisan dan keefektifan program pembelajaran energi terbarukan berbasis *multiple representations* terintegrasi *PjBL STEM* untuk melatih keterampilan berpikir spasial dan literasi *sustainability* siswa. Penelitian ini menggunakan metode campuran dengan R&D model *ADDIE*. Subjek penelitian adalah siswa SMA N 2 Kotabumi yaitu kelas XI MIPA 3 (kelas eksperimen) dan kelas XI MIPA 2 (kelas kontrol). Hasil penelitian menunjukkan bahwa program pembelajaran yang dikembangkan memiliki (1) Validitas yang sangat tinggi; (2) Praktis dalam implementasinya; (3) Efektif dalam meningkatkan keterampilan berpikir spasial dan literasi *sustainability*. Dengan demikian program pembelajaran berhasil memaksimalkan potensi peserta didik dan meminimalisir kesenjangan belajar (*learning gap*). Selain itu, kegiatan pembelajaran dapat melatih literasi *sustainability* terkait energi terbarukan yaitu (*sustainability attitudes*)/ perasaan mampu secara pribadi yang mempengaruhi sikap berkelanjutan dimana siswa telah mampu membuat energi terbarukan dan memiliki sikap menghemat energi serta mempresentasikan hasilnya. Pengembangan program pembelajaran yang dilakukan penulis sangat direkomendasikan karena membuat siswa aktif belajar dan sejalan dengan kebijakan pemerintah dalam implementasi kurikulum saat ini dimana pembelajaran harus berbasis proyek.

Analisis data hasil penelitian menunjukkan bahwa program pembelajaran yang dikembangkan layak untuk dijadikan alternatif inovasi pembelajaran fisika khususnya pada topik energi terbarukan dalam mempersiapkan generasi muda yang lebih siap menghadapi perubahan dan perkembangan zaman.

Kata Kunci: Keterampilan Berpikir Spasial, Literasi *Sustainability*, *Multiple Representations*, *PjBL STEM*, Energi Terbarukan.

ABSTRACT

DEVELOPMENT LEARNING PROGRAM BASED MULTIPLE REPRESENTATIONS INTEGRATED PjBL *STEM* TO FOSTER SPATIAL THINKING SKILLS AND *SUSTAINABILITY* LITERACY STUDENT HIGH SCHOOL ON THE TOPIC OF RENEWABLE ENERGY

By

DENI ANGGRAINI

This study aims to describe the validity, practicality and effectiveness of a renewable energy learning program based on multiple representations integrated PjBL STEM to foster students' spatial thinking skills and sustainability literacy. This study uses mixed methods with the ADDIE R&D model. The research subjects were students of SMA N 2 Kotabumi, namely class XI MIPA 3 (experimental class) and class XI MIPA 2 (control class). The research results show that the learning program developed has (1) very high validity; (2) practical in its implementation; (3) Effective in improving spatial thinking skills and sustainability literacy. Thus the learning program succeeds in maximizing the potential of students and minimizing learning gaps. Besides that, learning activities can foster sustainability literacy related to renewable energy, namely (sustainability attitudes) / feelings of personal ability that affect sustainable attitudes where students have been able to make renewable energy and have an attitude of saving energy and presenting the results. The development of learning programs carried out by the author is highly recommended because it makes students actively learn and is in line with government policies in implementing the current curriculum where learning must be project-based.

Analysis of research data shows that the learning program developed is feasible to be used as an alternative innovation in physics learning, especially on the topic of renewable energy in preparing young people who are better prepared to face changes and developments of the times.

Keywords: Spatial Thinking Skills, Sustainability Literacy, Multiple Representations, PjBL STEM, Renewable Energy.