ABSTRAK

DEDI ANTO S. Pengembangan Buku Ajar Biologi SMA Berbasis *Science, Technology, Engineering, and Mathematics* (STEM) Terhadap Kemampuan Literasi Sains Siswa Pada Materi Pertumbuhan dan Perkembangan Tumbuhan.

Penelitian ini bertujuan untuk menghasilkan buku ajar Biologi SMA Berbasis *Science, Technology, Engineering, and Mathematics* (STEM) terhadap kemampuan literasi sains siswa pada materi pertumbuhan dan perkembangan tumbuhan yang valid dan mendeskripsikan respon guru biologi dan siswa terhadap buku ajar yang telah dikembangkan serta untuk mengetahui efektivitas dari buku ajar tersebut. Penelitian ini merupakan jenis penelitian pengembangan *Research and Development* (R&D) menggunakan prosedur pengembangan model *Borg and Gall*. Populasi penelitian adalah siswa kelas XII IPA SMA Negeri 1 Lawe sigala-gala yang berjumlah 4 kelas dengan sampel 2 kelas yang diambil secara acak. Instrumen pengumpulan data berupa lembar penilaian untuk ahli materi, ahli desain instruksional, ahli bahasa, ahli *layout*, lembar angket guru biologi, dan siswa, serta tes kemampuan literasi sains. Teknik analisis data yang telah diperoleh menggunakan deskriptif kuantitatif. Hasil penelitian menunjukan bahwa buku ajar biologi berbasis STEM sangat layak dengan presentase kelayakan oleh tim ahli materi sebesar 93,71% sangat baik, ahli desain intruksional dengan persentase nilai sebesar 96,41% sangat baik, ahli bahasa dengan persentase nilai sebesar 92,70% sangat baik, ahli *layout* dengan persentase nilai sebesar 95,74% sangat baik, dan hasil tanggapan guru biologi dan siswa sangat baik. Buku ajar biologi berbasis STEM yang dikembangkan efektif berdasarkan kemampuan literasi sains (Z=3,873 dan P=0,000). Peningkatan rata-rata nilai N-gain pada kelas eksperimen menunjukkan peningkatan kemampuan literasi sains dengan nilai 0,48 berkategori sedang. Hal ini menunjukkan bahwa buku ajar biologi berbasis STEM efektif digunakan untuk kemampuan literasi sains siswa pada materi pertumbuhan dan perkembangan tumbuhan.

Kata Kunci: *Pertumbuhan dan Perkembangan Tumbuhan, Buku Ajar, Kemampuan Literasi Sains.*

ABSTRACT

DEDI ANTO S. Development of High School Biology Teaching Book Based on *Science, Technology, Engineering, and Mathematics* (STEM) On Students' Science Literacy Skills in Plant Growth and Development Materials.

This research aims to produce a *science, technology, engineering, and* mathematics (STEM) biology teaching book on students' science literacy skills in valid plant growth and development materials and describe the response of biology teachers and students to teaching books that have been developed and to find out the effectiveness of the teaching book. This research is a type of Research and Development (R&D) development research using Borg and Gall model development. The study population was a student of class XII of State High School IPA 1 Lawe sigala-gala which amounted to 4 classes with a sample of 2 classes taken randomly. Data collection instruments in the form of assessment sheets for material experts, instructional design experts, linguists, layout experts, biology teacher questionnaire sheets, and students, as well as tests of science literacy skills. Data analysis techniques that have been obtained using quantitative descriptive. The results showed that STEM-based biology textbooks are very feasible with a percentage of eligibility by a team of material experts of 93.71% very good, instructional design experts with a percentage of values of 96.41% are very good, linguists with a percentage of grades of 92.70% are very good, layout experts with a percentage of scores of 95.74% are very good, and the results of biological and student teacher responses are very good. STEM based biology is effectively developed based on science literacy skills (Z=3.873 and P=0.000). An increase in the average N-gain score in the experimental class showed an improvement in science literacy skills with a value of 0.48 moderate category. This suggests that STEM-based biology textbooks are effectively used for students' science literacy abilities on plant growth and development materials.

Keywords: *Plant Growth and Development, Teaching Books, Abilities Science Literacy.*