ABSTRAK

SARI MAULINA HARAHAP. NIM. 8216122010. Pengembangan E-Modul Berdiferensiasi Berbasis *Problem Based Learning* (PBL) Mata Pelajaran Ilmu Pengetahuan Alam (IPA). Tesis. Medan: Teknologi Pendidikan Program Pascasarjana Universitas Negeri Medan, 2024.

Pengembangan E-Modul Berdiferensiasi berbasis *Problem Based Learning* (PBL) sangat diperlukan sebagai media belajar yang memberikan pengalaman lebih kaya kepada siswa. E-Modul ini dilengkapi dengan audio, video tutorial, dan tautan yang memudahkan siswa mencapai tujuan pembelajaran secara praktis, efektif, serta melatih literasi teknologi sesuai dengan perkembangan pendidikan. Namun, pembelajaran yang bersifat monoton dan *teacher-centered* masih sering terjadi, seperti di SMP Negeri 43 Medan, khususnya pada mata pelajaran IPA yang membutuhkan visualisasi konkret. Penelitian ini merupakan penelitian pengembangan (*Research & Development)* yang bertujuan untuk menganalisis kelayakan, kepraktisan, dan keefektifan E-Modul Berdiferensiasi berbasis PBL pada mata pelajaran IPA. Menggunakan model ADDIE (*Analyze, Design, Development, Implementation, Evaluation*), penelitian ini dilakukan pada siswa kelas VII dalam materi Bumi dan Tata Surya. Kelayakan divalidasi oleh ahli materi, desain pembelajaran, dan desain grafis, serta diujicobakan kepada siswa. Kepraktisan dinilai melalui angket guru dan siswa, sedangkan keefektifan diuji dengan uji *t-independent* dan *N-Gain* antara kelas eksperimen (pembelajaran dengan E-Modul) dan kontrol (pembelajaran dengan buku ajar) dengan jumlah sampel 62 siswa. Hasil menunjukkan E-Modul sangat layak dengan rata-rata 87,55 persen, sangat praktis menurut siswa (95,25%) dan guru (95,75%), serta dinyatakan efektif dengan adanya perbedaan rata-rata hasil belajar yang signifikan (p-value 0,001 < 0,05). N-Gain kelas eksperimen sebesar 85,71 persen (efektif), sedangkan kelas kontrol 62,86 persen (cukup efektif). E-Modul ini terbukti layak, praktis, dan efektif dalam meningkatkan hasil belajar siswa secara optimal, dan diharapkan guru dapat mendorong penggunaan media pembelajaran berbasis teknologi di masa depan.

Kata Kunci: Pembelajaran Berdiferensiasi, E-Modul, Praktis, *Problem Based Learning*

ABSTRACT

SARI MAULINA HARAHAP. NIM. 8216122010. Development of a Differentiated E-Module Based on Problem Based Learning (PBL) for Natural Science Subjects. Thesis. Medan: Educational Technology of Postgraduate School of the State University of Medan, 2024.

The development of a differentiated E-Module based on Problem Based Learning (PBL) is crucial as a learning tool that offers richer experiences for students. Equipped with audio, tutorial videos, and links, the E-Module helps students achieve learning objectives practically and effectively while enhancing their technology literacy. However, teacher-centered and monotonous teaching methods still dominate, as observed at SMP Negeri 43 Medan, particularly in Natural Science subjects requiring more concrete visualization. This Research & Development (R&D) study aimed to analyze the feasibility, practicality, and effectiveness of a differentiated E-Module based on PBL in Natural Science. Utilizing the ADDIE model (Analyze, Design, Development, Implementation, Evaluation), the study focused on 7th-grade students for Earth and the Solar System topic. Feasibility was validated by material, learning design, and graphic experts, and students testing, while practicality was assessed through questionnaires from teachers and students. Effectiveness was measured using t-independent tests and N-Gain between the experimental class (E-Module) and the control class (textbooks) with 62 students. The results showed that the E-Module was highly feasible with an average of 87,55 percent, highly practical according to students (95,25%) and teachers (95,75%), and effective, with a significant difference in average learning outcomes (p-value 0,001 < 0,05). The N-Gain for the experimental class was 85,71 percent (effective), compared to 62,86 percent (moderately effective) for the control class. It is hoped that teachers will encourage the use of technology-based learning media in the future considered these study findings.

Keywords: Differentiated Learning, E-Module, Practical, Problem Based Learning