

ABSTRAK

Natanael Mayor Hutaeruk: Peluang dan Hambatan Penerapan Pendekatan Pembelajaran Mendalam (Deep Learning) dalam Pembelajaran Teknik Otomotif di Era Efisiensi Anggaran Pendidikan Tahun 2025

Penelitian ini bertujuan untuk mengidentifikasi peluang dan hambatan dalam penerapan pendekatan pembelajaran mendalam (deep learning) pada pembelajaran Teknik Otomotif di SMK Swasta Mandiri Medan dalam konteks efisiensi anggaran pendidikan tahun 2025. Penelitian ini dilaksanakan pada program keahlian Teknik Kendaraan Ringan Otomotif (TKRO) selama dua minggu dengan menggunakan metode kualitatif deskriptif. Informan dipilih melalui teknik purposive sampling yang melibatkan kepala sekolah, kepala program keahlian, guru produktif otomotif, dan siswa. Data dikumpulkan melalui wawancara semi-terstruktur, observasi partisipatif pasif, dan dokumentasi. Analisis data dilakukan melalui tahap open coding, axial coding, dan selective coding. Keabsahan data diperkuat melalui analisis SWOT serta triangulasi metode dan triangulasi sumber. Hasil penelitian menunjukkan bahwa peluang internal utama terletak pada karakter pembelajaran praktik otomotif yang selaras dengan pemecahan masalah nyata, khususnya dalam kegiatan troubleshooting. Pembelajaran berbasis proyek mampu meningkatkan motivasi siswa karena memberikan kesempatan untuk menganalisis gejala, mengumpulkan data, dan menyusun kesimpulan berbasis bukti. Selain itu, ketersediaan sarana dasar bengkel memungkinkan penerapan pembelajaran mendalam secara bertahap sesuai dengan prioritas kompetensi. Adapun hambatan internal meliputi belum meratanya literasi pedagogis guru dalam merancang pembelajaran berbasis pembelajaran mendalam, perangkat ajar yang belum secara konsisten mengarahkan proses inkuiri dan refleksi, keterbatasan jam pembelajaran produktif, serta variasi kemampuan siswa yang memerlukan scaffolding dan diferensiasi. Hambatan eksternal berkaitan dengan efisiensi anggaran yang membatasi pelatihan dan pengadaan peralatan, tingginya kebutuhan bahan habis pakai dan biaya perawatan, pesatnya perkembangan teknologi kendaraan, serta kebutuhan pengelolaan kemitraan industri yang berkelanjutan. Secara keseluruhan, peluang penerapan pembelajaran mendalam lebih dominan dibandingkan hambatan, sehingga pendekatan ini layak dikembangkan melalui penguatan bertahap yang menekankan optimalisasi sumber daya, penyempurnaan perangkat ajar, pelatihan internal guru, pemanfaatan sumber belajar digital, serta kolaborasi dengan dunia industri.

Kata kunci: pembelajaran mendalam, teknik otomotif, pendidikan vokasi, peluang dan hambatan, efisiensi anggaran pendidikan.

ABSTRACT

Natanael Mayor Hutaeruk: Opportunities and Challenges in Implementing a Deep Learning Approach in Automotive Engineering Learning in the Era of Education Budget Efficiency 2025

This study aims to identify the opportunities and challenges in implementing a deep learning approach in Automotive Engineering learning at SMK Swasta Mandiri Medan within the context of education budget efficiency in 2025. The study was conducted in the Light Vehicle Engineering (TKRO) program over a period of two weeks using a descriptive qualitative method. Informants were selected through purposive sampling, involving the principal, head of the expertise program, automotive vocational teachers, and students. Data were collected through semi-structured interviews, passive participant observation, and documentation. Data analysis was carried out through open coding, axial coding, and selective coding. The validity of the data was strengthened through SWOT analysis, as well as method triangulation and source triangulation. The findings indicate that the main internal opportunity lies in the nature of automotive practical learning, which aligns with real-world problem-solving, particularly in troubleshooting activities. Project-based learning enhances student motivation by enabling them to analyze symptoms, collect data, and draw evidence-based conclusions. In addition, the availability of basic workshop facilities supports the gradual implementation of deep learning based on competency priorities. Internal challenges include the uneven distribution of teachers' pedagogical literacy in designing deep learning-based instruction, teaching materials that do not consistently guide inquiry and reflection processes, limited instructional time, and varying student abilities that require scaffolding and differentiation. External challenges are related to budget efficiency constraints that limit training and equipment procurement, high costs of consumable materials and maintenance, rapid technological advancements in the automotive field, and the need for sustainable industry partnerships. Overall, the opportunities for implementing deep learning are more dominant than the challenges. Therefore, this approach is feasible to be developed through gradual strengthening that emphasizes resource optimization, improvement of teaching materials, internal teacher training, utilization of digital learning resources, and collaboration with industry.

Keywords: deep learning, automotive engineering learning, vocational education, opportunities and challenges, education budget efficiency.