

## ABSTRAK

**Wahyu Widodo: *Pengembangan Media Pembelajaran dengan Model Project Based Learning (PjBL) Berbasis Website Pada Hasil Belajar Materi Sistem Rem Mobil di Kelas XI TKRO SMKS Musda Perbaungan*. Skripsi. Fakultas Teknik, Universitas Negeri Medan. 2025.**

Pada mata pelajaran Konsentrasi Keahlian Otomotif (KKO), peserta didik menghadapi berbagai kendala, seperti rendahnya motivasi belajar, kurangnya pemahaman terhadap materi, serta hasil belajar yang belum memuaskan. Kondisi ini disebabkan oleh penerapan metode pembelajaran konvensional yang berpusat pada pendidik, serta keterbatasan media pembelajaran yang digunakan, seperti papan tulis dan proyektor LCD. Untuk mengatasi permasalahan tersebut, penelitian ini bertujuan mengembangkan media pembelajaran interaktif berbasis laman web dengan pendekatan *Project Based Learning* (PjBL) yang dinilai layak dan efektif. Penelitian ini dilaksanakan di SMKS Musda Perbaungan dengan melibatkan peserta didik kelas XI TKRO 1 sebagai subjek penelitian. Metode yang digunakan adalah Research and Development (R&D) dengan mengacu pada model pengembangan ADDIE, yang meliputi tahap Analisis, Perancangan, Pengembangan, Implementasi, dan Evaluasi. Hasil penelitian menunjukkan bahwa media pembelajaran yang dikembangkan memenuhi kriteria kelayakan. Penilaian oleh ahli media, ahli desain pembelajaran, dan ahli materi memperoleh skor rata-rata berturut-turut sebesar 0,87; 0,92; dan 0,98, yang termasuk dalam kategori “valid”. Uji coba perseorangan memperoleh nilai rata-rata 59,33; uji coba kelompok kecil sebesar 59,55; dan uji coba kelompok besar sebesar 59,7 — seluruhnya tergolong dalam kategori “valid”. Rata-rata keseluruhan nilai kelayakan adalah 30,23. Dari aspek efektivitas, terdapat peningkatan signifikan pada hasil belajar peserta didik, dari rata-rata nilai prates sebesar 49,44 menjadi 91,66 pada pascates, dengan selisih peningkatan sebesar 42,22. Nilai N-Gain sebesar 0,83 menunjukkan kategori peningkatan tinggi, dan tingkat efektivitas mencapai 83,49% (efektif). Berdasarkan temuan tersebut, media pembelajaran interaktif berbasis laman web dengan pendekatan PjBL dinyatakan sangat layak dan efektif dalam meningkatkan hasil belajar peserta didik pada mata pelajaran KKO di kelas XI TKRO SMKS Musda Perbaungan.

**Kata kunci: Media Pembelajaran Interaktif, Laman Web, *Project Based Learning* (PjBL), Mata Pelajaran Konsentrasi Keahlian Otomotif (KKO), SMKS Musda Perbaungan**

## ABSTRACT

**Wahyu Widodo: *Development of Learning Media with Website-Based Project Based Learning (PjBL) Model on Learning Outcomes of Car Brake System Material in Class XI TKRO SMKS Musda Perbaungan. Thesis. Faculty of Engineering, State University of Medan. 2025.***

In the Automotive Expertise Concentration (KKO) subject, students face various obstacles, such as low learning motivation, lack of understanding of the material, and unsatisfactory learning outcomes. This condition is caused by the application of conventional learning methods that are centered on educators, as well as the limitations of the learning media used, such as whiteboards and LCD projectors. To overcome these problems, this study aims to develop interactive learning media based on web pages with a *Project Based Learning* (PjBL) approach that is considered feasible and effective. This research was conducted at SMKS Musda Perbaungan involving class XI TKRO 1 students as research subjects. The method used is Research and Development (R&D) with reference to the ADDIE development model, which includes the stages of Analysis, Design, Development, Implementation, and Evaluation. The results of the study showed that the learning media developed met the eligibility criteria. The assessment by media experts, learning design experts, and material experts obtained an average score of 0.87; 0.92; and 0.98, respectively, which are included in the "valid" category. The individual trial obtained an average score of 59.33; the small group trial was 59.55; and the large group trial was 59.7 — all of which were included in the "valid" category. The overall average value of eligibility was 30.23. In terms of effectiveness, there was a significant increase in student learning outcomes, from an average pre-test score of 49.44 to 91.66 in the post-test, with a difference in increase of 42.22. The N-Gain value of 0.83 indicates a high increase category, and the effectiveness level reached 83.49% (effective). Based on these findings, interactive learning media based on web pages with the PjBL approach is declared very feasible and effective in improving student learning outcomes in the KKO subject in class XI TKRO SMKS Musda Perbaungan.

**Keywords:** Interactive Learning Media, Web Page, Project Based Learning (PjBL), Automotive Expertise Concentration Subject (KKO), SMKS Musda Perbaungan