

ABSTRAK

Tigor Maringan Siahaan: Pengembangan E-Modul Sistem Pengereman Berbasis Kooperatif *Think Pair Share* (TPS) Pada Siswa Kelas XI Program Keahlian Teknik Kendaraan Ringan Di SMK Negeri 2 Medan. Skripsi. Fakultas Teknik Universitas Negeri Medan. 2025

Penelitian ini bertujuan untuk mengetahui proses pengembangan e-modul pembelajaran berbasis kooperatif *Think Pair Share* (TPS) pada materi sistem pengereman kendaraan ringan di kelas XI program keahlian teknik kendaraan ringan penelitian ini dilakukan di kelas XI program keahlian teknik kendaraan ringan di SMK Negeri 2 Medan. Untuk mengetahui kelayakan dan mengetahui keefektifan e-modul sistem pengereman kendaraan ringan berbasis kooperatif *Think Pair Share* (TPS) pada siswa kelas XI program keahlian teknik kendaraan ringan di SMK Negeri 2 Medan. Metode penelitian yang digunakan adalah model penelitian dan pengembangan (*Research and Development*). Subjek penelitian ini adalah 36 siswa dari kelas XI program keahlian teknik kendaraan ringan. Teknik pengumpulan data dilakukan dengan observasi, wawancara, angket dan tes. Pengembangan e-modul dilakukan melalui uji coba perorangan yang melibatkan 3 siswa secara individu, 12 siswa dalam kelompok kecil, dan 36 siswa dalam lapangan. Uji kelayakan dilakukan validasi oleh ahli media oleh dosen Teknik Mesin Unimed, ahli desain pembelajaran oleh dosen Teknik Mesin Unimed dan ahli materi guru Teknik Kendaraan Ringan di SMK Negeri 2 Medan, yang dimana setiap ahlinya berjumlah satu orang. Terkait hasil dari pengembangan e-modul pembelajaran ini menunjukkan bahwa hasil dari ahli media menunjukkan presentase 98,52%, validasi ahli desain pembelajaran menunjukkan presentase 93,42%, validasi ahli materi pembelajaran menunjukkan presentase 95,58 %, sehingga e-modul tersebut layak untuk di uji coba. Respon peserta siswa terhadap media menunjukkan presentase 96,05 % dan respon guru 94,05 %. Ketuntasan belajar siswa tercapai 100% termasuk kedalam kategori sangat efektif. Sehingga penelitian pengembangan e-modul pembelajaran sistem pengereman berbasis *Think Pair Share* (TPS) pada siswa kelas XI program keahlian teknik kendaraan ringan di SMK Negeri 2 Medan dinyatakan valid, layak dan efektif.

Kata Kunci: Pengembangan E-modul Pembelajaran, *Think Pair Share*, ADDIE, sistem pengereman

ABSTRACT

Tigor Maringan Siahaan: *Development of an E-Module for a Cooperative Think Pair Share (TPS) Braking System for Grade XI Students in the Light Vehicle Engineering Program at SMK Negeri 2 Medan. Thesis. Faculty of Engineering, Medan State University. 2025*

This study aims to determine the process of developing a cooperative Think Pair Share (TPS) e-module for light vehicle braking systems in grade XI of the light vehicle engineering program. This study was conducted in grade XI of the light vehicle engineering program at SMK Negeri 2 Medan. To assess the feasibility and effectiveness of the cooperative Think Pair Share (TPS)-based e-module on the braking system of light vehicles for students in the 11th grade of the Light Vehicle Technology program at SMK Negeri 2 Medan. The research method used was the Research and Development (R&D) model. The research subjects were 36 students from the 11th grade of the Light Vehicle Technology program. Data collection techniques included observation, interviews, questionnaires, and tests. The e-module development was conducted through individual trials involving 3 students individually, 12 students in small groups, and 36 students in the field. The feasibility test was validated by a media expert from the Mechanical Engineering Department at Unimed, a learning design expert from the Mechanical Engineering Department at Unimed, and a subject matter expert from the Light Vehicle Engineering Department at SMK Negeri 2 Medan, with each expert representing one field. The results of the e-module development showed that the media expert's validation indicated a percentage of 98.52%, the learning design expert's validation indicated a percentage of 93.42%, and the subject matter expert's validation indicated a percentage of 95.58%, thus making the e-module suitable for testing. Student responses to the media showed a percentage of 96.05%, and teacher responses showed a percentage of 94.05%. Student learning achievement reached 100%, falling into the category of highly effective. Therefore, the research on the development of an e-learning module for a braking system based on the Think Pair Share (TPS) method for Grade XI students in the Light Vehicle Technology program at SMK Negeri 2 Medan is deemed valid, feasible, and effective.

Keywords: *Development of E-learning Modules, Think Pair Share, ADDIE, braking system*