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Development and Implementation of Interactive Multimedia for Achieving Learning Outcomes in Manufacturing Engineering Drawing Elements

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Abstract

This study addresses challenges in the learning process of manufacturing engineering drawing elements, including insufficient student engagement, monotonous teaching methods, suboptimal learning media, and low student achievement, with 60% failing to meet the minimum competency standards. The primary objective of this research is to develop relevant, interactive multimedia to enhance learning outcomes in the design of complex assembly drawings, assess the feasibility of the media, evaluate student responses, and compare its effectiveness to other instructional methods in improving academic performance and student motivation.

The research employed the ADDIE development model and was conducted at SMKN 1 Semarang, focusing on 11th-grade students in the Mechanical Engineering program. A total of 90 students from three classes participated, with each class receiving different instructional treatments. Students completed motivation questionnaires during the learning process, while those using interactive multimedia were asked to provide feedback on their experience with the media.

The results indicate that the interactive multimedia developed is feasible and effective, as evidenced by expert evaluations and highly positive student responses. The application of interactive multimedia, integrated with a problem-based learning model, was more effective than video-assisted lecture methods and problem-based learning models. This study concludes that using interactive multimedia in conjunction with problem-based learning significantly enhances student learning outcomes and motivation. The innovation of this research lies in integrating interactive multimedia for teaching manufacturing engineering drawing elements.

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