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Teaching Configuration Design of Parts through Experiential Learning

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Abstract

Configuration design of parts is a topic in mechanical engineering design unit that requires students to analyse the product structure breakdown, consider different features in the parts, and how those features are arranged and connected to achieve the intended functions of the product. Often, students have difficulties visualise, understand and apply the theoretical concepts learned in lecture setting. The motivation of this project is to enhance teaching of configuration design of parts via experiential learning. Students will disassemble and reassemble actual products in the classroom to conduct product structure breakdown analysis, evaluate the effectiveness of existing configuration, explore alternatives to achieve better design characteristics through a guided, reflective process in workshop arrangement. Through these learning activities, improvement of students' learning on the topic was observed. The effectiveness of this pedagogy was measured through student feedback via questionnaire, and their actual performance in the unit assessment.

Keywords: design configuration; design thinking; engineering design; experiential learning; visualisation