

Design and Development of a Tool for Measuring Learning Outcomes in a Manufacturing Engineering Program Based on Outcome-Based Education

Suriya JIRASATITSIN^{a,b}, Wanida RATTANAMANEE^{a,b}, Thanate RATANAWILAI^{a,b}, Klangduen POCHANA^{a,b}, Chukree DAESA^{a,b}, Pichet TRAKARNCHASIRI^{a,b} and Kunlapat THONGKAEW^{a,b,1}

^aSmart Industry Research Center, Engineering, Faculty of Engineering, Prince of Songkla University, Songkhla, Thailand

^bDepartment of Industrial and Manufacturing Engineering, Faculty of Engineering, Prince of Songkla University, Thailand

Abstract. Curriculum certification is the evaluation of a curriculum's quality. There are numerous accreditation systems in the world, such as the Accreditation Board for Engineering and Technology (ABET) and the Asean University Network Quality Assurance (AUN-QA). The results of program learning outcomes (PLOs) have been displayed for each accreditation system. Curriculum management should be designed to ensure that students' PLOs are met by the time they graduate. All subjects in the curriculum assist students in achieving their PLOs. Each subject in the curriculum contributes to the attainment of each PLO. On the other hand, each subject must complete a number of PLOs successfully. All student assessments of course learning outcomes (CLOs) were included to reflect the PLOs. To assess the CLOs, activities are allotted to each subject in order to meet the CLO requirement. To assess learning outcomes, it is necessary to compile all lecturer and student task data. However, managing this process requires considerable time. In contemplation of outcome-based education, this study designs and develops a tool to evaluate manufacturing engineering program learning outcomes. The "AAD-MfE program" was developed as a systemic tool to resolve the complexity of PLOs' data quality assessment. This program displays reliable information because all instructors simultaneously input task scores, subject grades, and CLO measurements. The PLOs of students have been monitored in real-time so that they can be improved while students are studying. The AAD-MfE program is a tool for demonstrating curriculum outcomes that are professional and appropriate for certification.

Keywords. Outcome-based education, engineering program, outcome measurement

¹ Corresponding Author, Mail: tkunlapat@eng.psu.ac.th