ASPEN HYSYS MOOC FOR SUPPORTING BLENDED-COOPERATIVE LEARNING CHEMICAL ENGINEERING PROCESS DESIGN CLASS

Mohd Kamaruddin bin Abd Hamid

Faculty of Engineering, Universiti Malaysia Sabah, Jalan UMS, 88440 Kota Kinabalu, Sabah, Malaysia

email: kamaruddinhamid@ums.edu.my

Abstract

This innovation proposes the integration of a Massive Open Online Course (MOOC) based on Aspen HYSYS, a widely used industrial process simulator, with a blended cooperative learning approach in a Chemical Engineering Process Design class. The pedagogical framework employed is Technological-Pedagogical-Content Knowledge (TPACK), which combines technological knowledge, pedagogical strategies, and subject-specific content. The chosen technology is a Learning Management System (LMS) based on Moodle, which supports online self-paced learning through the MOOC. The innovation aims to enhance the learning experience by combining face-to-face cooperative learning with online self-directed learning modules. Students will have access to the MOOC, allowing them to engage in self-paced learning for basic chemical engineering process simulation using Aspen HYSYS. This approach provides an effective way for students to master the fundamentals of process simulation and encourages self-directed learning. In addition to the online modules, in-class exercises and team discussions will be conducted to reinforce the knowledge gained through the MOOC. The incorporation of asynchronous online activities further promotes active learning and collaboration among students. The content of the course aligns with Outcome-Based Education (OBE) principles, focusing on the application of theoretical knowledge to industrial-based case studies. By utilizing Aspen HYSYS, students will gain practical experience in simulating chemical processes commonly encountered in industry. The proposed innovation offers several advantages. Firstly, it provides students with a flexible and self-paced learning environment, accommodating various learning styles and preferences. Secondly, the integration of industrial-based projects adds value to the course, bridging the gap between academia and industry. Lastly, the combination of face-to-face cooperative learning and online self-directed learning promotes collaborative problem-solving skills and independent thinking among students. Overall, this innovative approach leveraging Aspen HYSYS MOOC, TPACK, and blended cooperative learning has the potential to enhance the learning outcomes and engagement of students in a Chemical Engineering Process Design class, enabling them to develop essential skills for their future careers in the field of chemical engineering.

Keywords: Aspen HYSYS, Massive Open Online Course, Blended Learning, Cooperative Learning, Process Simulation