Integrated online problem-based learning (ion-pbl) module of physics

ABSTRACT

Education professionals have frequently expressed concern about the declining enrollment in physics, particularly at the pre-university level. Hence, it might lead to another issue not many students are attracted to enrol in Physics program at universities or colleges. Thus, to overcome the scenario, many physicist practitioners and educators try to devise instructional methods of teaching and learning to make physics subjects more attractive to students. Problem-based learning (PBL) is one of the many instructional approaches that promote 21st-century skills, i.e., collaboration, leadership, communication, critical thinking, and problem-solving, and makes learning physics much more meaningful in contrast to the conventional method. There is proof of the successfulness of PBL through face-to-face classes, but methods through online learning still raise questions. Hence, the present study aims to develop an Integrated Online Problem-Based Learning known as iON-PBL module in Physics for pre-university students, developed by using ADDIE instructional design. ADDIE is a typical instructional design that consumes five (5) essential stages, e.g., Analysis, Design, Development, Implementation, and Evaluation. The aim of developing this iON-PBL module is to be used as the established teaching and learning module at the center for the preparatory of science and technology. This module can also be used for any level of pre-university students, i.e., form-six, matriculation, A-level, etc. Preliminary finding for this iON-PBL used among pre-university students at UMS seems to enhance and retain students' motivation to learn physics, particularly on their Intrinsic Value (IV) and Cognitive Strategy Use (CSU). However, there are other variables still undergo of data collection. This module will expect to be the basis of the full implementation of iON-PBL amongst pre-university students not only in Physics but in other STEM and STEAM subjects i.e., Mathematics, Biology, Chemistry, Technology, Engineering, and Arts.