Chapter 11

A Case Study on Improving Learner Engagement by Incorporating ICT Tool Usage and Active Learning Strategies in Engineering Courses

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ABSTRACT

In the present scenario, the innovation in teaching is necessary to engage the students for the course of 36 to 40 hours. At the end of the course, the average student’s strength will excel in performance and attains the course outcome with in-depth knowledge. To overcome the difficulties of slow and inactive learners for attaining the course outcome, it is necessary to renovate the teaching methodology. A few innovative learning methods like think pair share (TPS) activity, flipped classroom, online education, virtual classroom techniques, project-based learning, activity-based learning provoke the inactive or slow learners to be more active in learning the course. From studies, the current generation students are smart, and they feel conventional teaching methods like blackboard and PowerPoint presentations are monotonous. Here, the significance and impact of using ICT tools over conventional teaching methods is discussed on the fluid power automation course as a case study.

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INTRODUCTION
In present days, the faculty members are practicing many active learning methods to make students to understand and remember fundamental concepts. The current teaching method needs innovation in delivering the lecture and to engage the students for entire course of 36 to 40 hours. At the end of the course, very few students attain the course outcome and excel in course depth knowledge. To overcome the hurdles of slow and inactive learners to meet the course outcome, it is necessary to renovate the teaching methodology. Initially, the course and its outcome are designed based on a consideration of ICT tools usage and skill (soft and creative) development approach engaging the students with innovative teaching practices. The addition of lab components in course content enriches the student practical knowledge. Few innovative learning methods like think pair share (TPS) activity, flipped classroom, online education, virtual classroom techniques, project based learning, activity-based learning stimulate the inactive or slow learners to be more active in learning the concepts. Learning through activities encourages the students concentration towards the course in South Indian education platform. Instead of conventional learning, the innovative ICT tools based learning dominates the current digitalized student’s era. From studies, the present generation students are smart and they are uninterested in traditional teaching methods like black-board and power-point presentations. Traditional methods of learning reduced the interests among the students in learning the courses. As a consequence, presently there are many deliberations in upgrading the student education from Outcome-Based Education (OBE) to Conceive-Design-Implement and Operate (CDIO).

The CDIO syllabus focuses on developing personal, interpersonal and system building among students. This concept is new for all South Indian students and it emphasis on learner-centric education methodology. To create the revolution in an education system, the students should be well-equipped to face the challenges in learning methods. Nowadays, the students are experiencing the renovated teaching methods like simulation-based learning, project-based learning, demonstration-based learning, smart lab-based learning, flipping and inverse flipping classroom and gamifying based learning. By doing so, the students can learn more than the syllabus and think beyond the understanding category to apply category level as per the outcome-based education concept. Subsequently, students express more attention and self-motivation to apply the concepts from day to day life activities to enrich their skill from their knowledge. In this chapter, a set of engineering students from Thiagarajar College of Engineering (TCE) have experimented ICT tool-based learning approach for Fluid power automation course. A part of the students in TCE are from rural areas and they are lacking in English proficiency. The sudden implementation of a new education system for these students will not be much effective. It is a challenging task to successfully implement the ICT tools in courses for the rural based students. In this case study, grouping of students into two batches
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