World Conference on
Teaching, Learning, and Education

16 - 18 October 2026 Milan , Italy

Enhancing Formative Assessment through Taxonomy-Aligned Course Outcomes and Lesson Plan based CO-PO Mapping in Engineering Education: An Indian Context

Dr. Reshma Talari , Shaik Mohammad Imran , M. Lakshmipathi Rao

National Institute of Technology Andhra Pradesh, India

Abstract

Outcome-Based Education (OBE) has become an important component in Engineering Education in India. It is an approach that starts by defining what students should be able to achieve and then design teaching, learning, and assessment to ensure those outcomes are successfully attained. In engineering education, student achievement is evaluated through Program Outcomes (POs) defined by the National Board of Accreditation (NBA), India. Since these POs are broad and Program-level in nature, their attainment is assessed indirectly through the achievement of Course Outcomes (COs) across all the courses in the curriculum. Well-defined COs and their alignment with POs serve as key factors of Curriculum effectiveness and student assessment in OBE. However, inconsistencies in the formulation of COs, especially not considering appropriate Bloom's Taxonomy levels of Cognitive Domain, hinder the effectiveness of formative assessment and CO-PO mapping accuracy. In this study, a systematic method is adopted in framing COs based on Bloom's Taxonomy levels. In addition, a lesson plan-based approach for CO-PO mapping is proposed by integrating Course content, COs, POs, Teaching-Learning activities, and assessment components. This approach aims to provide a more justifiable strength of mapping between COs & their respective POs. The proposed approach is applied and evaluated with a case study to examine how COs formulated as per taxonomy levels influence assessment design. The findings indicated that these framed COs enable more focused formative assessment, establishing a clear link between Teaching Learning activities & provides a logical basis for establishing CO-PO correlations. This study proposes a practical framework to support engineering institutions in strengthening the implementation of OBE and improving the reliability of academic assessment.

Keywords: **Bloom's Taxonomy levels; Outcome Based Education; Formative Assessment; Course Outcomes; Program Outcomes**