

ABSTRACT:

Problem-Based Learning (PBL) is an inductive learning approach that uses a realistic problem as the starting point of learning. Unlike in medical education, which is more easily adaptable to PBL, implementing PBL in engineering courses in the traditional semester system set-up is challenging. While PBL is normally implemented in small groups of up to ten students with a dedicated tutor during PBL sessions in medical education, this is not plausible in engineering education because of the high enrollment and large class sizes. In a typical engineering course, implementation of PBL consisting of students in small groups in medium to large classes is more practical. However, this type of implementation is more difficult to monitor, and thus requires good support and guidance in ensuring commitment and accountability of each student towards learning in his/her group. To provide the required support, Cooperative Learning (CL) is identified to have the much needed elements to develop the small student groups to functional learning teams. Combining both CL and PBL results in a Cooperative Problem-Based Learning (CPBL) model that provides a step by step guide for students to go through the PBL cycle in their teams, according to CL principles. Suitable for implementation in medium to large classes (approximately 40-60 students for one floating facilitator), with small groups consisting of 3-5 students, the CPBL model is designed to develop the students in the whole class into a learning community. This paper provides a detailed description of the CPBL model. A sample implementation in a third year Chemical Engineering course, Process Control and Dynamics, is also described.