



Importance of Project-Based Learning for Pharmacy Education

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Dear Editor,

Project-based learning (PBL) is defined as a question-based teaching approach that ensures the active participation of the learners in building knowledge by enabling them to perform meaningful projects and develop concrete products. PBL is generally regarded as an alternative to traditional teaching provided by teachers. It is recognized that PBL is a favorable approach that enhances student learning in higher education.¹ PBL was incorporated into educational practice in early 1980s. The history of PBL has its roots in the progressive tradition encouraged by John Dewey. He emphasized the concept of "learning through practice". John Dewey maintained that the lecture room should be a sort of society, and in the learning process, the focus should be on the students. PBL is a highly efficient technique that allows students; to express their views on topics that cover areas of their interest, raise their queries, use various tools, develop different concepts and theories, make use of skills attained through real and meaningful learning processes, and respond ingeniously to questions in and out of the classroom.²

The purpose of this letter is to focus on pharmacy education and the role of incorporating PBL into pharmacy training programs. The Doctor of Pharmacy is a 5-year professional degree that includes a multidisciplinary program. This program comprises theory sessions with hands-on demonstrations and experiments. With developing expertise in the area of therapeutics, the

theoretical and training aspects of the pharmacy syllabus are progressively emphasized in the development of group work, collaborations, brainstorming, time management, and finding solutions for different problems. Over the past two decades, there has been a shift toward pharmacy practice. Currently, pharmacists are actively engaged in primary care services such as health promotion, patient education, drug utilization, disease surveillance, testing, and prevention, in addition to their traditional role of supplying medication products to patients. Because effective interdisciplinary collaboration is required to deliver these services, pharmacists need to develop competencies that promote interprofessional relationships. In the traditional education system, teaching is a common means of conveying basic knowledge and concepts, particularly to a wide audience. Despite the benefits of traditional education, many studies have shown that this mode of class style is incapable of introducing critical thinking skills essential for any professional degree, *i.e.*, doctor of pharmacy. Hence, there is an urgent need to transform teaching methods to ensure that pharmacy students have the necessary skills. One-Way to do this is to bring PBL into pharmacy teaching. PBL can be achieved through lab experiments, field studies, and work projects, leading to increased scientific knowledge and skills that can be implemented in many areas of pharmacy, such as analytical chemistry, biopharmaceutics, medicinal chemistry, pharmacognosy, pharmaceutical microbiology, industrial pharmacy, pharmacology, and clinical pharmacy.³⁻⁵

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PBL promotes a profound approach (*i.e.* not just shallow teaching) to learning and promotes autonomous and continuous learning skills. It motivates students to develop inner inspiration by delivering programmatic objectives that help them excel in collaboration and active learning. It provides a real-time solution to clinical challenges. In addition, it allows students to develop entrepreneurial skills to contribute their part to the country's economy by promoting decision-making capacities, finding opportunities, taking risks, communicating ideas, and building trust.⁶ Therefore, it is recommended that instead of traditional tests and examinations that are done later, students' skills and attitudes should be evaluated on-site in classes while discussing problems and their solutions. However, assessing the progress of students in PBL tutorials continues to be a challenge because most traditional methods of evaluation are not harmonized and do not quickly evaluate what is learned in the PBL class. Peer assessment could be a way to gauge learning in PBL sessions. Peer review in higher education is a process in which students use predetermined criteria and norms to evaluate the work of their peers. Peer review allows students to receive input on their learning. Peer evaluation can be cumulative or formative and could include qualitative responses regarding the assessment criteria used instead of a quantitative focus on the actual score. Peer review may be conducted in the context of one-on-one or teamwork. Peer assessment in teamwork takes one of three forms, including intra-group, inter-group, and extra-group. As an intragroup, each member of a group assesses the performance or contribution of other individual members within the group regarding the shared product. In an intergroup context, one or more people in one group assess another team's performance or product. In an extra-group setting, individuals who are not part of the group judge the performance or product of a group. Through group work, peer review enhances student learning, builds self-confidence, encourages students to work collaboratively, improves their decision-making skills, and makes them aware of their own lives. Peer evaluation can also be beneficial for faculty members by reducing their workload, providing new perspectives on student learning processes, and encouraging staff to be more transparent about evaluation goals and scoring criteria. Since peer review and PBL focus on group collaboration and sharing key goals and philosophies,

peer assessment appears to be an appropriate method for developing PBL tutorials. It is concluded that the traditional method of lectures is seen as a teacher-centered educational approach, in which knowledge is passed on by and from the instructor and passively acquired by the learners. PBL makes it possible to use contextual thinking and development that improves the richness of depictions in long-term memory and is identified as an effective cognitive approach for problem-solving. It is suggested that the implementation of PBL models in pharmacy education should be supported by well-designed pedagogical research.^{3,7}

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Ethics

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