ORIGINAL RESEARCH PAPER
Volume - 14 | Issue - 06 | June - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PROBLEM BASED LEARNING: TRANSFORMING MEDICAL EDUCATION FOR COMPETENCY DEVELOPMENT

Anatomy

Dr. Rizwana Farhat* MD (Anatomy), Assistant Professor, Department Of Anatomy, Hamdard Institute Of Medical Sciences & Research And Associated Hahc Hospital, New Delhi, India *Corresponding Author

Dr. Shireen Fatima MD (Paediatrics) Assistant Professor, Department Of Paediatrics, Hamdard Institute Of Medical Sciences & Research And Associated Hahc Hospital, New Delhi, India

ABSTRACT

Medical education is the cornerstone of healthcare systems worldwide, shaping future physicians and ensuring quality patient care. It is undergoing a transformative shift driven by the demands of modern healthcare and educational innovation. Addressing current challenges while embracing new strategies is crucial for producing competent, compassionate, and adaptable healthcare professionals. Problem based learning (PBL) is one the innovations in medical education worldwide. It is a student-centred teaching method that emphasizes in solving real-world problems to enhance knowledge, skills, and attitudes in medical education. It helps students to develop competencies such as communication, professionalism, and ethical values, which are essential for modern medical practice. Unlike traditional teaching methods, it focuses on active learning and fostering deeper understanding, reducing reliance on memorization. Having significance in competency-based medical education (CBME), it enables the students to become competent physicians who meet societal needs. In contrast to conventional teacher-focussed approaches, PBL requires teachers to adopt the role of facilitators, guiding students through self-directed learning and collaborative problem-solving processes. While PBL fosters creativity, independence, and interpersonal skills, its application faces obstacles related to student adaptation, tutor training, curriculum design, and institutional resistance. By addressing these challenges through structured training, community-oriented curriculum design, and effective communication with experienced institutions, it can be successfully integrated into medical education systems. This article reviews the application of PBL in medical education, its benefits, challenges and strategies for implementation. It also explores the multifaceted role of teachers in PBL, highlighting their responsibilities in guiding, motivating, and evaluating students, as well as designing effective learning resources.

KEYWORDS

Medical Education, Problem Based Learning, Teacher Role, Lifelong Learning

INTRODUCTION

Medical education is the process of training individuals to become competent and ethical medical professionals. It involves the systemic acquisition of knowledge, clinical skills and professional attitude necessary for the prevention, diagnosis and treatment of diseases as well as promotion of the overall health. Conventional teaching methods, though foundational, have been increasingly scrutinized for their effectiveness in preparing students for clinical practice. However, these traditional methods often fail to equip graduates with the clinical competence, problem-solving abilities, and adaptability required in modern healthcare.[1] As global health challenges become more complex, there is a pressing need to equip medical graduates with not only knowledge and clinical skills but also critical thinking, empathy, and adaptability. Competency-Based Medical Education (CBME) emphasizes measurable outcomes, including knowledge, skills, attitudes, and professionalism. Accordingly, medical education has undergone significant changes over the past decades, transitioning from teacher-centred to student-centred learning approaches.[2]

Problem-Based Learning (PBL), a student-centred approach has emerged as an innovative strategy in medical education, addressing the limitations of traditional methods. By integrating basic and clinical sciences, fostering critical thinking, and promoting self-directed learning, PBL equips medical students with the skills necessary for effective clinical practice and lifelong learning.[3] PBL, introduced by Howard S. Barrows in 1962 at McMaster University, Canada, is a key teaching strategy in CBME.[4] In PBL, learners encounter a clinical problem and work collaboratively to solve it using their existing knowledge. This process helps them to identify the gaps in their understanding and motivates them to research and acquire new information independently.[5]

Medical education has traditionally relied on teacher-centred, subject-based approaches, where students passively absorb information delivered by instructors. PBL addresses these shortcomings by placing students at the centre of the learning process, with teachers serving as facilitators rather than lecturers. Teachers can adapt to new teaching methods by undergoing training, improving technological skills, combining traditional and modern approaches, and staying updated with advancements in education. Many medical schools fail to implement PBL effectively due to poor problem design, unbalanced group selection, and unclear tutor roles. Resistance from traditional tutors further exacerbates implementation challenges. Resolving these issues through accurate tutor selection, training, and collaboration with successful institutions can enhance PBL outcomes.[6] This article explores the principles, benefits, and implementation of PBL in medical training, emphasizing its role in preparing future healthcare professionals to meet evolving societal and professional demands.

Key Features Of PBL

PBL is a modern teaching method that focuses on small groups of students working collaboratively to solve real-world problems or case studies under the guidance of a facilitator. A case-based approach is adopted in PBL, where students are presented with clinical scenarios to analyse and solve, fostering critical thinking and practical application of knowledge. Teachers act as facilitators, guiding discussions, asking open-ended questions, and maintaining motivation within the group rather than delivering direct instruction.[7]

Collaborative learning is a cornerstone of PBL, as students work in small groups to enhance interpersonal communication and teamwork skills. The learning cycle concludes with reflection and analysis, where students evaluate the concepts learned and their approach to problem-solving. These features collectively prepare students for the dynamic and evolving nature of medical practice by emphasizing active engagement, teamwork, and the integration of knowledge into practical scenarios.[8]

Role Of Teacher As A Facilitator In PBL

In PBL, teachers play an important role as facilitators, mentors, and resource providers, shifting away from traditional lecturing to guide students through the learning process. They help students to navigate the learning journey by providing orientation and support, encouraging self-directed study skills, and fostering a sense of ownership in their education. They provide access to problem-based learning materials, such as simulated patient problems and promote collaboration by fostering teamwork and discussion in small-group settings. Additionally, teachers evaluate students' progress by assessing their problem-solving processes, reasoning skills, and ability to apply knowledge effectively, while providing constructive feedback to refine learning strategies.[9]

An Illustration Of PBL Describing A Case Scenario:

Mr. Karan, a 48-year-old office worker, comes to the clinic complaining of a sudden inability to move the left side of his face. He recently recovered from a cold and ear infection. He is unable to close his left eye, his mouth droops on the same side, and he reports drooling and loss of taste on the anterior part of the tongue. On examination,

there is flattening of the left nasolabial fold, no forehead wrinkling, and incomplete eye closure on the affected side.

This scenario is presented to a student group, who are tasked with discussing the case, engaging in self-directed learning, conducting online research, and collaborating over a designated time. The group then presents their findings, including further investigations and management protocols, to a facilitator. The facilitator and students engage in discussions to ensure the learning objectives are achieved. This example illustrates how PBL encourages critical thinking, self-directed learning, and collaborative problem-solving.

Benefits Of PBL In Medical Education

By shifting from passive memorization to active problem-solving, PBL enhances knowledge retention and fosters critical thinking, reasoning, and analytical skills. It encourages self-directed learning, allowing students to develop personalized study strategies and take ownership of their education. The collaborative nature of PBL promotes teamwork and communication skills, essential for patient-centred care and professional practice. Students gain early clinical exposure, connecting basic sciences with clinical contexts, which helps them develop professional skills and better attitudes toward patients compared to traditional teaching methods. It also nurtures intrinsic motivation, as curiosity-driven learning fosters lifelong engagement and inquiry. Additionally, it prepares students for the dynamic nature of medical practice by integrating research skills, problem-solving abilities, and the application of knowledge to real-world scenarios.[10] Overall, PBL equips students with the competencies needed for effective clinical practice and adaptability in modern healthcare.

Implementation Strategies

As medical education continues to evolve, PBL stands as an essential element for training competent, adaptable, and patient-centred physicians. The implementation of PBL involves six steps[11] (Table 1).

Table 1: Steps Of Implementation Of PBL With Its Strategies

S.No.	Steps	Implementation Strategies
1	Identify Learning Outcomes	Define knowledge and skills to be assessed
2	Design Real-World Problems	Create scenarios that stimulate inquiry and reasoning
3	Facilitate Group Discussions	Encourage brainstorming and collaborative learning
4	Support Research	Guide students in gathering and applying information
5	Assess Performance	Evaluate solutions and provide constructive feedback
6	Continuous Improvement	Gather feedback to refine the PBL process

PBL promotes self-directed learning by encouraging students to take ownership of their education. Consequently, it enhances cognitive skills, group dynamics, and communication abilities, preparing students for real-life medical practice.

Challenges In Implementation Of PBL

Implementation of PBL in medical education faces several challenges that require careful consideration and strategic solutions. Creating suitable learning environments that are learner-centric, knowledge-centric, assessment-centric, and community-centric is a significant hurdle for medical education units and administrative authorities. Additionally, PBL demands students to take ownership of their learning, which can be difficult for those accustomed to traditional methods.[12]

The reduction of didactic lectures is another challenge, as traditional lecture-based teaching needs to be minimized and transformed into interactive and focused sessions, requiring a shift in teaching strategies. Although challenging, this role is highly rewarding, as it transforms the educational experience for both students and teachers. Faculty training is critical, as the lack of clear implementation guidelines and untrained faculty can hinder the success of PBL. Furthermore, gaining students' trust and ensuring their engagement in the PBL process is crucial for its success. These challenges can be addressed through faculty development programs, curriculum modifications, and fostering collaboration between students and educators.[13]

How PBL Is Different From Traditional Methods?

PBL is a valuable approach in medical education, fostering critical thinking, self-directed learning, and competency development of the learners. It differs significantly from traditional teaching methods in its approach, focus, and outcomes [14](Table 2).

Table 2: Comparison Of PBL And Traditional Teaching Methods

METHODS	PROBLEM BASED LEARNING	TRADITIONAL TEACHING
Learning approach	Student-centred. Learners actively engage in solving real-world problems, taking responsibility for their own learning	Teacher centred. Information is delivered directly by the instructor through lectures, with students passively receiving knowledge
Focus	focuses on developing critical thinking, problem-solving, teamwork, and application of knowledge to practical scenarios	emphasize memorization and acquisition of theoretical knowledge
Role of teacher	teacher acts as a facilitator, guiding discussions, asking open-ended questions, and encouraging exploration	teacher is the primary source of knowledge, delivering structured lessons and explanations
Learning environment	Learning space encourages collaboration, students work in small groups to discuss, analyse, and solve problems	students learn independently or through large-group lectures
Assessment	focuses on formative assessment, including reflection, group discussions, and application of concepts	relies heavily on summative assessments like exams and tests.
Skill development	encourages interpersonal communication, teamwork, and self-directed learning, along with professional skills	primarily helps in developing theoretical knowledge, with limited emphasis on practical or interpersonal skills
Learning goals	students identify their own learning goals based on the problem presented	learning goals are predefined by the teacher or curriculum

While traditional methods are effective for delivering structured knowledge, PBL is better suited for fostering critical thinking, practical application, and teamwork, making it particularly valuable in medical education where real-world problem-solving is essential. Collaboration, mentorship, and feedback are also key to successfully transitioning to innovative teaching practices.

CONCLUSION

By fostering integration, critical thinking, collaboration, and self-directed learning, PBL represents a paradigm shift in medical education and equips future healthcare professionals with the skills necessary for effective clinical practice and lifelong learning. As medical education continues to evolve, the adoption of PBL and the redefinition of the teacher's role will play a crucial part in preparing future healthcare professionals for the dynamic and interdisciplinary nature of their work. A hybrid approach combining PBL and traditional methods may offer the best of both worlds, enhancing the overall learning experience necessary for effective medical practice.

REFERENCES

1. Divya Reddy Pannala and Shyamala, R. 2021. Evolution of Teaching Methods in Medical Educatin Over the Years. Int.J.Curr.Microbiol.App.Sci. 10(11): 362-368.
2. Gehlawat M, Thumati G, Samala P, Alekhya CL, Shailaja A, Sharma A. Competency-based medical education for Indian undergraduates: Where do we stand? APIK J Int Med. 2023 Apr;0(0):0. DOI: 10.4103/ajim.ajim_161_22.
3. Banu A, Khan KA, Rajkumar J. Problem-based learning in medical education: A review. J Educ Res Med Teach. 2014;2(2):1-5.
4. Barrows HS. Problem-Based Learning: An Approach to Medical Education. Springer, New York, 1999.
5. S. Johnson, P. Finucane. The emergence of problem-based learning in medical education. Journal of Evaluation in Clinical Practice, 6, 3, 281-91.
6. Azer, S. A. (2001). Problem-based learning: A critical review of its educational objectives and the rationale for its use. Neurosciences, 6(2), 83-89.
7. Roberts D, Ousey K. Problem based learning: Developing the triggers. Experiences from a first wave site. Nurse Educ Pract. 2003;3(1):1-5. doi: 10.1016/S1471-5953 (03) 00073-8
8. Shrivastava SR, Shrivastava PS, Ramasamy J. Problem-Based Learning in Undergraduate Medical Curriculum: An Indian Perspective. Arch Med Health Sci, 2013;1:200-1.

9. Schmidth HG. Foundations of problem based learning: some explanatory notes. Med Educ.1993; 27(5):422-32.
10. Mrityunjay, Kumar D, Gupta S. Medical Education-Present Scenario & Future. DOAJ. 2010 Jul.
11. Dasgupta A. Problem-Based Learning: Its Application in Medical Education. J West Bengal Univ Health Sci. 2020; 1(2):11-18.
12. Steward TJ. Learning environments in medical educations. Med Teach. 2006; 28(4):387-89.
13. Elaine HJ, Karen G. Problem based learning: An overview of process and impact on learning. Health Prof Educ.2016; 2(2):75-9.
14. Nandi PL, Chan JNF, Chan CPK, et al. Undergraduate Medical Education: Comparison of Problem-Based Learning and Conventional Teaching. HKMJ, 2000;6:144-8.