



Commentary

Problem-based learning in medical school: A student's perspective



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HIGHLIGHTS

- PBL alone is not a one-size-fits-all curriculum concept.
- Students are taught to use information that can be obtained by scholarly searches.
- An issue arises when a group member is a topic expert.
- Small conceptual weaknesses coming out of the session are to be expected.
- My classmates and I are overwhelmingly satisfied with the majority PBL model.

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ABSTRACT

Problem-based learning (PBL) has been a concept in existence for decades yet its implementation in medical student education is limited. Considering the nature of a physician's work, PBL is a logical step towards developing students' abilities to synthesize and integrate foundational concepts into clinical medicine. Harvard's recently redesigned Pathways curriculum has shifted almost exclusively towards PBL in its one-year preclinical curriculum. This piece provides my thoughts, both derived from my own reflections as well as conversations and observations of my peers, on the effectiveness, advantages, and disadvantages of a PBL curriculum. All in all, the feelings of my peers and I regarding PBL has been overwhelmingly positive despite potential areas of improvement and continued fine-tuning.

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The twenty-first century has seen countless innovations, ranging from smart phones and tablet devices to social media networks, that influence the way we communicate and learn. An increasingly implemented idea in the realm of medical education is problem-based learning (PBL), sometimes similar to case-based learning (CBL). PBL is an approach to learning that focuses on dissection and discussion of problems or cases in small groups usually supervised by one or more expert tutor(s) or instructor(s). Whereas this pedagogical approach to learning through discussion has infiltrated in some aspect to many U.S. and foreign medical schools, certain medical schools such as Harvard have shifted almost exclusively towards a PBL preclinical curriculum while others have refrained from any PBL integration. As a first year medical student at Harvard in the freshly sculpted Pathways curriculum, I have experienced and observed problem-based learning in action. In this report, I provide a succinct student's perspective on PBL and its suitability for medical education along with areas for improvement and continuous fine-tuning.

PBL curricula generally rely on the premise that students can learn the concepts pertinent to each PBL session independently outside of class time thereby freeing up time for critical analysis and group discussion. Many schools have retained some proportion of lectures to provide an avenue for content delivery to students. On the other hand, select schools such as Harvard have done away with almost all lectures. It is important to note, however, that Harvard does provide student guides and preparatory material that the students can use to guide their learning. In effect, the students are thrown into an ocean of medical knowledge with key navigation tools. Readiness assessment exercises for each preparatory session for which students study ensure students stay on track while also giving the students an idea of their mastery of foundation concepts related to the PBL session's topic(s). Class time is thereby almost exclusively devoted to small group discussions on scenarios, many of which are clinically oriented.

At Harvard, PBL sessions consist of problem presentation and small group discussion followed by large group discussion. This schematic allows for individuals to take a moment to analyze the problem alone (in groups) followed by dissection and discussion amongst a small group of four that can challenge and support each

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individual's thoughts. This dynamic processing of ideas and feedback provides quick, robust insight into a problem. However, the more important benefit of the discussion lies in the encouragement and nutriment of critical analysis of a variety of ideas and stances. Students are allowed the freedom to not only discuss "correct" answers but also an opportunity to knowingly challenge "correct" answers to foster deeper understanding of the question and topic at hand. Team members build comradery and develop an appreciation for the breadth of views on the simplest of topics. Notably, student participation dictates that students are more engaged.

Application of basic science concepts to clinically relevant scenarios plays a powerful role in not only understanding and synergizing concepts but also in developing comfort with integrating basic science principles with clinical medicine. For example, examining cystic fibrosis on various levels from transcription to translation to post-translational modifications and transport provides opportunities for problem solving, deeper understanding of foundational concepts, and clinical knowledge/presentation of a common disease. Importantly, I believe that students can learn lifelong learning skills through PBL as students learn content independently before sessions through various, often public-access, resources and work through sessions replete with data from primary literature sources. In essence, students are taught to use information that can be easily obtained by scholarly searches to understand and propose solutions for complex problems for which there may be no current solution. I have been very satisfied with the decreased emphasis on memorizing minutiae that can be easily searched and the increased emphasis on thinking in various dimensions.

Though PBL has many advantages, I have observed several potential issues with the PBL curriculum. In practice, PBL alone is not a one-size-fits-all curriculum concept. This has become rather apparent in the lack of a lecture for anatomy. Certain concepts are difficult to grasp from a dense anatomy excerpt; thus, having some form of lecture for subjects such as anatomy can be very helpful in understanding certain concepts. Another issue possibly arises when a group member is a topic expert due to previous advanced degrees or other experience(s) such as research. My peers have commented on the presence of an expert often diminishing the learning experience as those experts reportedly speak very little due to already knowing the answer and do not participate in the group dynamics, effectively leaving the other 3 members with one less member. As an expert in certain topics myself from past research experiences, I have tried my best to facilitate group dynamics by either slowly leading members towards the correct answer when stuck or by providing deeper insight to a topic when group members quickly understand topics. Furthermore, I have attempted to only answer large group discussion questions when no other students have responses to a posed question. The presence of a short guide on how to be an effective group member can be quite useful.

With regards to discussion dynamics, a variety of personalities co-exist in a PBL setting. Some students enjoy answering questions they know the answer to whereas other students are more shy about responding, perhaps in fear of voicing an incorrect answer. Though a limit on the number of students in large discussion groups helps relieve some pressure, I do sense that some students

are still shy about voicing answers that they are not completely confident is correct. I believe that whether personalities clash in disruptive ways depends heavily on the student body. Based on my interactions with my classmates and friends at various medical schools throughout the country, I feel that medical students are respectful and possess above average communication and interpersonal skills, particularly since they have been vetted through a rigorous though not flawless selection process. Thus it is important to focus on encouraging discussion of both correct and incorrect ideas.

While group and discussion dynamics are important, they are intrinsic to any model of learning and curricula can likely never be molded to fit all students perfectly. A more pressing issue identified was the pacing of sessions. While the session pacing seems comfortable for the majority of my peers, I have observed that students are sometimes left behind figuring out previous problems or ideas either due to not voicing their lack of understanding or by vocalization of a need to press on to cover all relevant parts for a session. However, timing is a delicate issue that likely cannot accommodate every student. Since the PBL model depends on students to go back after each session and review the session topics for integration, reinforcement, and clarification, small conceptual weaknesses or confusion coming out of the PBL sessions are, in my opinion, to be expected.

All in all, PBL has been immensely enjoyable for my classmates and me. Learning how to apply knowledge to complex problems is the basis for future advancements in science as well as excellent care of patients.

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