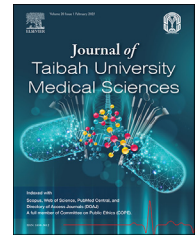Taibah University

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Letter to the Editor

Integrating problem-based and team-based learning: A hybrid approach for advancing medical education pedagogy

Paul Arjanto, PhD [a],[*] and Mint H. Raya Aditama, PhD [b]

[a] *Department of Educational Management, Pattimura University, Indonesia*
[b] *Department of Guidance and Counseling, Universitas Nias Raya, Utara, Indonesia*

Dear Editor,

We are writing in response to the article, "Comparing PBL and TBL: Insights into Effectiveness and Efficiency in Medical Education," recently published in the Journal of Taibah University Medical Sciences.[1] This study has provided a substantial foundation for understanding the relative merits of Problem-Based Learning (PBL) and Team-Based Learning (TBL) as pedagogical strategies in medical education. Our commentary seeks to expand upon the findings and propose innovative approaches to integrate these strategies effectively.

A critical review of comparative effectiveness

The article highlights that both PBL and TBL promote student-centered learning, with notable effectiveness in enhancing critical thinking and collaborative skills. Specifically, the study reports that the difficulty and discrimination indices for assessment items showed no significant differences between the two methods. These findings corroborate prior research by Burgess et al., which emphasize that both PBL and TBL ensure balanced assessment outcomes, thus enabling equitable knowledge evaluation.[2,3] However, TBL demonstrates superior performance in resource-constrained settings due to its operational scalability. While TBL's structured approach with readiness assurance tests fosters improved engagement, PBL's emphasis on in-depth discussions provides a richer context for clinical reasoning. This dichotomy indicates an opportunity to integrate the preparatory rigor of TBL with the exploratory depth of PBL, creating a hybrid model to maximize pedagogical outcomes.

Resource efficiency and institutional adaptability

The study underscores that PBL's resource-intensive nature limits its scalability, requiring a high tutor-to-student ratio. In contrast, TBL's design accommodates larger groups with fewer facilitators, aligning with findings by Vogeltanz-Holm et al. and Lexén et al.[4,5] Institutions with constrained budgets or large cohorts could benefit significantly from TBL's efficiency. However, the authors' assertion that TBL is universally advantageous may oversimplify the issue. For instance, Almagribi et al. reveal that students in smaller settings often prefer PBL for its personalized learning environment, suggesting a context-dependent implementation strategy.[6] To address these challenges, we propose a tiered implementation model. Smaller groups could employ PBL for foundational learning, emphasizing self-directed inquiry. Conversely, TBL could be used for larger cohorts to reinforce theoretical knowledge and foster teamwork. This dual approach ensures optimal resource utilization while catering to diverse learner needs.[7]

Enhancing student engagement and motivation

The research highlights the motivational benefits of TBL's competitive elements and immediate feedback mechanisms. Similar findings are reported by Saalu et al., who observed significant improvements in classroom engagement through TBL.[8] However, this does not diminish the value of PBL's capacity to cultivate intrinsic motivation, as noted by Trullàs et al.[9] Both methods offer unique advantages in fostering engagement, and a hybrid model could incorporate competitive aspects into PBL's collaborative framework. For example, readiness assurance tests from TBL could be integrated into PBL scenarios, providing

* Corresponding address:
E-mail: paul.arjanto@lecturer.unpatti.ac.id (P. Arjanto)
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immediate feedback while maintaining PBL's focus on problem-solving. This strategy could enhance motivation across varying learner profiles.[4]

Hybridization: a future-oriented strategy

Several studies, including those by Burgess et al. and Zhang et al., advocate for hybrid approaches that blend PBL and TBL.[3,10] Such strategies leverage the strengths of each method, promoting comprehensive learning experiences. For instance, integrating TBL's readiness tests with PBL's discussion-oriented format could enhance both theoretical understanding and practical application. Additionally, technology can play a pivotal role in implementing hybrid models. Learning management systems (LMS) could support virtual readiness assurance tests and track student participation in PBL discussions. This integration aligns with Almagribi et al., who highlight the potential of digital tools to enhance instructional efficacy.[6]

Conclusions and recommendations

In conclusion, while the study effectively demonstrates the comparable educational outcomes of PBL and TBL, our analysis suggests that a hybrid model could offer the most comprehensive solution. By integrating the preparatory and engagement mechanisms of TBL with the exploratory depth of PBL, medical education institutions can achieve a balanced approach that maximizes resource efficiency and student outcomes. We recommend further research to evaluate hybrid models in diverse educational contexts. Specifically, longitudinal studies could provide insights into the long-term impacts of hybrid strategies on knowledge retention, clinical reasoning, and professional competencies. Moreover, the role of technology in facilitating these integrations warrants exploration, ensuring scalability and adaptability in various institutional settings.

References

1. Pohan RA, et al. Comparing PBL and TBL: insights into effectiveness and efficiency in medical education. **J Taibah Univ Med Sci Dec. 2024**; 19(6): 1085−1086. https://doi.org/10.1016/j.jtumed.2024.11.006.

2. Burgess A, et al. Team-based learning (TBL) in the medical curriculum: better than PBL? **BMC Med Educ 2017**; 17(1). https://doi.org/10.1186/s12909-017-1068-z.

3. Burgess A, Roberts C, Ayton T, Mellis C. Implementation of modified team-based learning within a problem based learning medical curriculum: a focus group study. **BMC Med Educ 2018**; 18(1). https://doi.org/10.1186/s12909-018-1172-8.

4. Vogeltanz-Holm N, Olson LM, Borg KE, Hill TM. Implementation and evaluation of a team-based learning approach within a hybrid problem-based learning medical education curriculum. **Med Sci Educ 2014**; 24(1): 125−133. https://doi.org/10.1007/s40670-014-0008-3.

5. Lexén A, Hultqvist J, Amnér G. Occupational therapy student experiences of a university mental health course based on an integrated application of problem-based and team-based learning. **Scand J Occup Ther 2018**; 25(1): 70−77. https://doi.org/10.1080/11038128.2017.1367416.

6. Almagribi AZ, Al-Qahtani SM, Assiri AM, Mehdar KM. Perceptions of medical students at Najran University on the effectiveness of problem-based learning and team-based learning. **BMC Med Educ 2024**; 24(1). https://doi.org/10.1186/s12909-024-06148-w.

7. Mcmullen I, Cartledge J, Levine R, Iversen A. Team-based learning for psychiatry residents: a mixed methods study. **BMC Med Educ 2013**; 13(1): 1−8. https://doi.org/10.1186/1472-6920-13-124.

8. Saalu LC, Abraham AA, Aina WO. Quantitative evaluation of third year medical students' perception and satisfaction from problem based learning in anatomy: a pilot study of the introduction of problem based learning into the traditional didactic medical curriculum in Nigeria. **Educ Res Rev 2010**; 5(4): 193−200.

9. Trullàs JC, Blay C, Sarri E, Pujol R. Effectiveness of problem-based learning methodology in undergraduate medical education: a scoping review. **BMC Med Educ 2022**; 22(1). https://doi.org/10.1186/s12909-022-03154-8.

10. Zhang W, Wei J, Guo W, Wang Z, Chen S. Comparing the effects of team-based and problem-based learning strategies in medical education: a systematic review. **BMC Med Educ 2024**; 24(1). https://doi.org/10.1186/s12909-024-05107-9.