

Teaming up to Learn: An Experience of Team-Based Learning in A Private Medical College

Muhammad Shahzad Farooq¹, Noor-I-Kiran Naeem², Sumera Ehsan³, Bushra Shaheen⁴, Uzma Kausar⁵, Rabia Javed⁶

¹ *Principal, ABWA Medical College, Faisalabad Pakistan*
Data analysis, Manuscript review

² *Assistant Professor, Department of Medical Education, ABWA Medical College, Faisalabad Pakistan*
Idea conception, Manuscript writing, Data collection & analysis

³ *Director, Department of Medical Education, Pakistan Medical & Dental Council, Islamabad Pakistan*
Idea conception, Manuscript review

⁴ *Professor, Department of Biochemistry, ABWA Medical College, Faisalabad Pakistan*
Data collection, Manuscript review

⁵ *Assistant Professor, Department of Medical Education, ABWA Medical College, Faisalabad Pakistan*
Data analysis, Manuscript review

⁶ *Academic Coordinator, Department of Medical Education, ABWA Medical College, Faisalabad Pakistan*
Data collection, Manuscript review

CORRESPONDING AUTHOR

Dr. Noor-i-Kiran Naeem

Assistant Professor, Department of Medical Education, ABWA Medical College, Faisalabad Pakistan
Email: noorikiran@yahoo.com

Submitted for Publication: 15-12-2023
Accepted for Publication 08-08-2024

How to Cite: Farooq MS, Naeem NK, Ehsan S, Shaheen B, Kausar U, Javed R. Teaming up to Learn: An Experience of Team-Based Learning in A Private Medical College. APMC 2024;18(3):232-236. DOI: 10.29054/APMC/2024.1539

ABSTRACT

Objective: We aim to explore the experience of team-based learning in a newly implemented integrated MBBS curriculum. **Study Design:** Cross-sectional study. **Settings:** ABWA Medical College, Faisalabad Pakistan. **Duration:** The study duration was from April 2023 to September 2023. **Methods:** This cross-sectional study involved 100 medical students via non-probability purposive sampling from 1st-year MBBS who participated in 2 team-based learning sessions offered in the "Hematopoietic Module". Students were asked to fill out a 16-item survey questionnaire regarding their experience of team-based learning. Data was analyzed through SPSS 25.0 software. **Results:** A total of 86/100 students returned the survey questionnaire. Overall students had a positive experience regarding team-based learning. The highest student rating was received for "Instructor facilitation in the learning process" while the lowest rating was received for the theme "learning outcomes achieved". **Conclusion:** The results provide an understanding of 1st-year MBBS students' perceptions of TBL, indicating areas of strength and opportunities for improvement. The positive reception emphasizes the importance of refining TBL practices to maximize its benefits in medical education.

Keywords: Team-based learning, Learning strategies, Active learning, Medical education.

INTRODUCTION

Recently, the medical colleges under the University of Health Sciences have implemented an integrated curriculum in undergraduate medical education.¹ Implementing an integrated curriculum shifts the focus towards student-centered learning, requiring a change in instructional strategies.² These strategies aim to involve techniques that foster active student learning as well as to build competencies of the seven-star PMDC doctor like communication skills and leadership. One such instructional strategy is team-based learning.³

While traditional methods of teaching and leadership skills are formally taught during later years of medical education, it has been suggested that junior learners, such as first-year medical students, may benefit from these interactive, innovative, and low-stake teaching strategies.⁴ Additionally, research emphasizes the

significance of integrating intentional goal setting with learners and the essential role of interested educators in the educational experience. Given the importance of cultivating teamwork and leadership skills early in medical education, it is clear that there is a need for a shift in focus towards providing students with opportunities to learn, develop, and master these skills throughout their medical education.⁵ Furthermore, the significance of cultivating these skills is evident in the improved engagement and satisfaction observed in graduate medical education.

In line with this, it is argued that medical schools and clinical training programs should assist students and trainees in absorbing, organizing, storing, and applying these skills through strategies such as active learning, problem-based learning, and team-based learning.^{1,6} This emphasizes the need for integrating cognitive learning

strategies into medical education, to better prepare students for active learning and collaborative teamwork.

Team-based learning has been shown to enhance not only teamwork and leadership skills but also content mastery in undergraduate medical education.⁷ Incorporating team-based learning with reflection and feedback has been demonstrated to improve both teamwork and leadership skills, as well as to increase content mastery in undergraduate medical education. Incorporating strategies such as retreats and team-based learning into medical curricula can address the need to cultivate teamwork and leadership skills early on.⁸ In addition, medical schools need to recognize the evolving landscape of incoming students who may already have exposure to cognitive learning strategies from their undergraduate experiences, which may influence their expectations for active learning using these strategies.⁹

The purpose of this study was to share our medical college's experience of implementing team-based learning strategies along with students' perceptions regarding this educational approach.

METHODS

This was a descriptive observational study aiming to evaluate students' perception of team-based learning methodology in undergraduate medical education in a private medical college after obtaining ethical approval from the Institutional Review Board (letter no. ABWA/MC/DME/823/2023-dated: 4th April 2023). The total duration of the study was 6 months, starting from April 2023 to September 2023.

One hundred undergraduate medical students of the 1st-year MBBS class of the newly introduced integrated curriculum, and who had attended the two Team-Based Learning sessions in the "Hematopoietic module" were included in the study.

The students who missed one session of Team-Based Learning were excluded from the study. Participation was kept voluntary, so the students had the liberty to refuse participation in the study.

A workshop on the Team-based learning method was conducted earlier to provide training to the concerned faculty members and demonstrators before the implementation of TBL sessions. A total of 6 faculty members and fifteen demonstrators attended the workshop. The faculty members were registered medical teachers (assistant Professor and above from the departments of anatomy, physiology and biochemistry) while demonstrators were junior doctors/instructors below the level of Assistant Professors. After the workshop, two TBL sessions were prepared on the topic of "Fluid Mosaic Model" and "Anemia" from the selected

hematopoietic module after discussion with the Module in charge. During this process, faculty was engaged in designing the MCQs to be given in each of the two sessions.

An orientation session was planned with the class to inform them about the methodology. Students' queries were addressed properly. Learning outcomes along with learning resources were shared with the students well before time via the class WhatsApp group. A day before the session's conduction, teams of students were announced to be divided into teams with designated facilitators. A total of 20 teams were made, comprising 5 students in each team. Teachers were prepared for mini-lectures and discussions in both sessions. These mini-lectures, timed to be brief yet comprehensive, were based on the iRAT results to ensure targeted and effective learning. The topics for these sessions were planned meticulously to align with the identified needs and gaps in students' understanding.

At the end of the second session, the survey questionnaire was distributed in the class to get the students' responses. This survey questionnaire contained 16 items and was prepared after a literature review, validated by two separate medical educationists and pilot-tested on a group of ten medical students. The survey questionnaire contained items regarding (1) Collaboration and Study Practices, (2) Instructor Facilitation in the Learning Process, (3) Organization of TBL Sessions, (4) Overall Satisfaction, (5) Impact on Learning Attitudes, (6) Effectiveness on Motivation, and (7) Learning Outcomes achieved. Special time was allocated for filling this survey feedback and the teaching session was concluded well before time as the permission had been attained from the Module charge.

All obtained data was put in SPSS software version 25.0 for analysis. After adding data into SPSS, data was checked for any missing values, so that any missing value found could be replaced with the median of the corresponding variable. All continuous data was presented in the form of mean \pm SD whereas categorical data was represented in the form of proportions and percentages. A p-value of <0.05 was taken as significant where applicable.

RESULTS

Out of 100 medical students, 86 medical students filled out the survey questionnaire, making an overall response rate of 86 %. The mean age of study participants was 18.9 \pm 0.74 years. Out of the total participating students, 51% were females and 49% were males (See Table 1):

Table 1: Demographic characteristics of study participants in a cross-sectional survey

Demographic Characteristics		Study Participants (n=86)	Percentage (%)
Gender	Male	42	49%
	Female	44	51%
Age	18 years	20	23.3%
	19 years	47	55.7%
	20 years	17	19.8%
	>20 years	2	1.2%

Table 2 represents the mean ratings of students on each item regarding their perceptions on team-based learning. As seen from the table students rated the item, "The instructor facilitated the learning process" the highest (4.19/5) while item, "TBL promoted the learning essentials of concepts of skill" was rated the lowest (3.16/5).

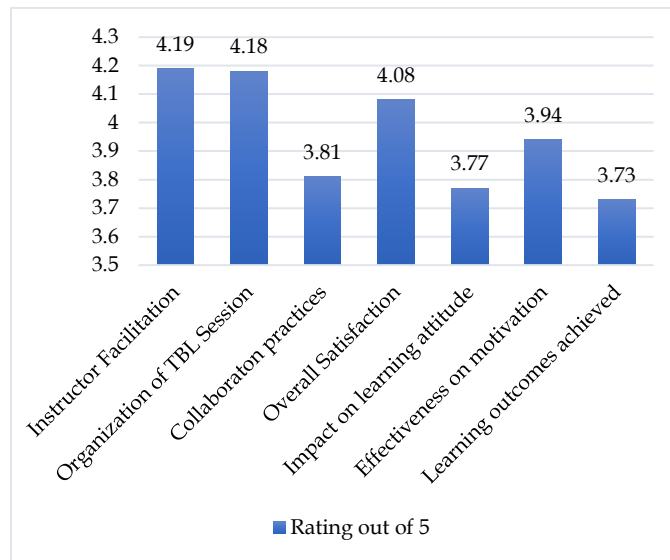
Table 2: Result analysis of 1st-year MBBS Student Perceptions on Team-Based Learning (TBL)

Survey Question	Rating out of 5 (n=86)
I frequently study with colleagues.	3.81
The instructor facilitated the learning process.	4.19
The TBL Session was well organized.	4.18
I will recommend TBL to other students.	4.07
Overall, I am satisfied with the TBL approach.	4.12
TBL had a positive impact on my learning attitude.	3.77
TBL helped to assess present knowledge	4.00
TBL helped to obtain a higher level of knowledge	4.07
TBL is an effective, motivating learning process.	4.04
TBL promoted effective cooperative learning.	3.79
TBL promoted increased reading of the textbook by the students.	3.86
TBL promoted the learning essentials of concepts of skills.	3.16
TBL reduced the amount of time needed for self-assessment.	4.07
TBL should be offered more frequently in the curriculum.	4.11
TBL challenged me to give my best.	3.51
The TBL Session was well organized.	4.18

The ratings of each of the 7 themes in survey questionnaires are represented in Figure 1 below. As seen

from the figure, the highest student rating was received for the theme "Instructor facilitation in the learning process" while the lowest rating was received for the theme "learning outcomes."

Figure 1: Student Rating various domains of TBL Session



DISCUSSION

This study aimed to evaluate 1st-year MBBS students' perceptions of team-based learning (TBL) sessions, revealing key insights across seven themes which are discussed as below:

Instructor Facilitation and Learning Process: Students highly value instructor facilitation (Rating: 4.19) during TBL sessions, highlighting the crucial role facilitators play in guiding students and creating a positive learning environment. Effective facilitation goes beyond traditional methods, contributing to improved teamwork, leadership skills, and content mastery in medical education. In support of the current findings, a study by Burgess *et al* highlights the critical role of facilitators in facilitating TBL.⁸ Their research underscores the positive impact of instructor engagement on student learning outcomes. In contrast, a study by Nanda *et al* suggests that over-reliance on facilitation may hinder the development of independent learning skills, necessitating a balanced approach to enhance student autonomy.¹⁰

In the true spirit of TBL, the role of the facilitator is crucial. A facilitator, unlike a traditional instructor, focuses on guiding the learning process rather than delivering content directly. They create an environment where students can engage deeply with the material, encouraging critical thinking and collaboration.⁸ Facilitators support teams in navigating complex

problems, ensuring that every student contributes and learns from the discussion. This role is essential in fostering a student-centered learning experience that promotes autonomy and enhances overall educational outcomes.

Organization of TBL Sessions: The positive response to the organization of TBL sessions (Rating: 4.18) indicates students perceive TBL as effectively structured and coordinated. A well-organized approach contributes to a favorable learning environment, enabling students to fully engage with the content and maximize the effectiveness of TBL. The positive response regarding the organization of TBL sessions resonates with the suggestions by Parmelee *et al*, emphasizing the importance of structured TBL sessions.¹¹ This AMEE guide recommends that well-organized sessions contribute to higher student satisfaction and engagement. Moreover, it is suggested that organized learning and team composition is important for having positive outcomes in interprofessional team learning.⁵

Collaboration and Study Practices: The moderate inclination (Rating: 3.81) toward collaborative study practices indicates the potential for enhancing collaborative learning experiences. TBL not only fosters collaboration but also allows students to achieve common learning objectives by working together as a team, promoting an interactive and engaging learning environment. The study aligns with research emphasizing the significance of collaboration and study practices in team-based learning (TBL).^{5,12} Van Diggele *et al*. found that TBL not only enhances collaborative learning but also encourages active student participation through role-playing and case discussions.¹³ However, there are contrasting perspectives from suggest that students may face challenges in adapting to collaborative practices.¹⁴ Institutional support plays an important role in supporting the students to overcome these challenges via the organization, planning and training of the facilitators.

Impact on Learning Attitudes: While the impact on learning attitudes received a generally positive rating (3.77), the reserved response suggests a nuanced perception. Further exploration is warranted to understand specific aspects contributing to this sentiment. The nuanced theme of the impact on learning attitudes resonates with the findings of Jackson *et al* who observed varied responses in student attitudes toward TBL.¹⁵ Their research suggests that individual learning preferences and prior experiences may influence the perceived impact on attitudes. In contrast, Nanda *et al* reported consistently positive shifts in learning attitudes among students exposed to TBL, emphasizing its potential for holistic student development.¹⁰

Effectiveness on Motivation: Perceived as effective and motivating (Rating: 4.04), TBL challenges students (Rating: 3.51) to give their best. While effective and motivating, there is room for improvement in making TBL more intellectually stimulating. Consistent with the current study, research by Darby *et al* supports the perception of TBL as an effective and motivating learning process.⁶ Their findings indicate a positive association between TBL implementation and increased student motivation. In contrast, a study by Zeb *et al* identified challenges in sustaining student motivation over time within a TBL framework, highlighting the importance of continuous reinforcement strategies.¹⁶

Learning Outcomes achieved Curriculum Integration: Positive outcomes in cooperative learning and textbook engagement are recognized. However, the theme of learning essentials and skills (Rating: 2.86) indicates an area for improvement. Students express a desire for more frequent TBL integration into the curriculum (Rating: 4.11). The positive recognition of cooperative learning and textbook engagement aligns with the findings of Gast *et al.*, who reported enhanced collaborative skills and increased engagement with course materials⁹. However, the identified need for improvement in promoting essential concept and skill learning echoes concerns raised the importance of aligning TBL activities with specific learning objectives to optimize skill development.^{9,17}

CONCLUSION

In summary, these results provide understanding of 1st-year MBBS students' perceptions of TBL, indicating areas of strength and opportunities for improvement. The positive reception emphasizes the importance of refining TBL practices to maximize its benefits in medical education.

LIMITATIONS

The study was limited by evaluation of 2 TBL sessions in one module at the study settings. Further studies can include more sessions evaluated with inclusion of other modules. Also comparative study can be performed to evaluate the long term outcomes of TBL in integrating knowledge among undergraduate medical students.

RECOMMENDATION & OVERALL SATISFACTION

High ratings for recommending TBL (Rating: 4.07) and overall satisfaction (Rating: 4.12) reflect students' positive sentiments. The likelihood of recommending TBL to peers and overall satisfaction underscores the approach's success and acceptance among students. The likelihood of recommending TBL and overall satisfaction aligns with previous research by Fakoya *et al*, who reported high student satisfaction with TB²L. Their study also found a

positive correlation between satisfaction and academic performance.

Whereas this study finds its strength in obtaining first-hand experience of the students who are the stakeholders in medical education regarding TBL, this study is limited to exploring only two points of two different TBL sessions. More studies are needed to explore such strategies in various modules and in different years. A multi-institutional study can be performed involving more medical colleges to understand the effectiveness of TBL in our local context.

CONFLICT OF INTEREST / DISCLOSURE

None.

ACKNOWLEDGEMENTS

None.

REFERENCES

1. Ajmal A, Manzoor I. Shift of Traditional Curriculum to Integrated Curriculum: A Drastic Step by University of Health Sciences (Uhs), Lahore - Editorial. *Journal of Akhtar Saeed Medical & Dental College*. 2023;5(1):1-3.
2. Fakoya AO, Ndrio M, McCarthy KJ. Facilitating active collaborative learning in medical education; a literature review of peer instruction method. *Advances in Medical Education and Practice*. 2023 Dec 31;1087-99.
3. PMDC. Pakistan Medical & Dental Council [Internet]. [cited 2018 May 8]. Available from: <http://www.pmdc.org.pk/AboutUs/RecognizedMedicalDentalColleges/tabid/109/Default.aspx>
4. Gleason BL, Peeters MJ, Resman-Targoff BH, Karr S, McBane S, Kelley K, et al. An active-learning strategies primer for achieving ability-based educational outcomes. *American journal of pharmaceutical education*. 2011 Nov 10;75(9):186.
5. Lairamore C, Morris D, Schichtl R, George-Paschal L, Martens H, Maragakis A, et al. Impact of team composition on student perceptions of interprofessional teamwork: A 6-year cohort study. *Journal of Interprofessional Care*. 2018 Mar 4;32(2):143-50.
6. Darby S, O'Hanlon D, Casterton S, Harding N, O'Brien AM, Quinn G, et al. Improved learning outcomes and teacher experience: A qualitative study of team-based learning in secondary schools. *Social Sciences & Humanities Open*. 2023 Jan 1;8(1):100590.
7. Burgess A, Bleasel J, Haq I, Roberts C, Garsia R, Robertson T, et al. Team-based learning (TBL) in the medical curriculum: better than PBL?. *BMC medical education*. 2017 Dec;17:1-1.
8. Burgess A, van Diggele C, Roberts C, Mellis C. Team-based learning: design, facilitation and participation. *BMC Medical Education*. 2020 Dec;20:1-7.
9. Gast I, Schildkamp K, van der Veen JT. Team-based professional development interventions in higher education: A systematic review. *Review of educational research*. 2017 Aug;87(4):736-67.
10. Nanda MS, Singh R, Kotwal S. Impact of introduction of team based learning on third year MBBS undergraduate students. *J Evol Med Dent Sci*. 2020 Nov 30;9(48):3613-8.
11. Parmelee D, Michaelsen LK, Cook S, Hudes PD. Team-based learning: a practical guide: AMEE guide no. 65. *Medical teacher*. 2012 May 1;34(5):e275-87.
12. Burgess A, Roberts C, Lane AS, Haq I, Clark T, Kalman E, et al. Peer review in team-based learning: influencing feedback literacy. *BMC medical education*. 2021 Aug 12;21(1):426.
13. van Diggele C, Roberts C, Haq I. Optimising student-led interprofessional learning across eleven health disciplines. *BMC Medical Education*. 2021 Dec;21:1-8.
14. Buhse M, Della Ratta C. Enhancing interprofessional education with team-based learning. *Nurse Educator*. 2017 Sep 1;42(5):240-4.
15. Jackson L, Otaki F, Powell L, Ghigliione E, Zary N. Study of a COVID-19 induced transition from Face-to-Face to Online Team-Based Learning in Undergraduate Family Medicine. *MedEdPublish*. 2020;9.
16. Zeb MA, Mahboob U, Shaheen N. Effect of team-based learning on critical thinking: A quasi-experimental study. *Pakistan journal of medical sciences*. 2022 Nov;38(8):2234.
17. Nauzeer S, Jaunky VC. A meta-analysis of the combined effects of motivation, learning and personality traits on academic performance. *Pedagogical Research*. 2021;6(3):97.