

The Effectiveness and Experiences with Adaptive Online Team based Learning (TBL) Amid Social Distancing in Health Sciences

1. Syeda Zarreen Raza 2. Sanaa Ahmed 3. Ziyad Sanaullah 4. Zahid Ali Memon 5. Zunairah Rais 6. Shakeel Ahmed

ABSTRACT

Objective: To find out the effectiveness and experiences of students with adaptive online TBL strategy utilized during COVID-19 lockdowns.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Jinnah Sindh Medical University from 1st December to 31 December 2020.

Materials and Methods: A total of 177 students were included in the study. After taking permission from the institutional review board, a link to consent and questionnaire was sent to the students. The questionnaire was divided into software and TBL related questions.

Results: The mean score for the section on software was 3.9 while for TBL activity was 3.6. When students were asked about their experience with the activity, they responded good (47.5%) for working as a team and for communication with colleagues and faculty as good (42.9%) while only 32.5% of the students scored 3 out of 5 for their satisfaction with the online TBL strategy. Overall, 50.8% agreed that online TBL sessions helped clarify their concepts and 46.9% agreed that they will like future online TBL sessions.

Conclusion: Students were satisfied with their online TBL sessions and appreciated the different aspects of the strategy such as working as a team, motivation, and communication resulting in clarification of concepts.

Key Words: Universities, Professionalism, Motivation, Pakistan, COVID-19, and Students, Medical.

Citation of article: Raza SZ, Ahmed S, Sanaullah Z, Memon ZA, Rais Z, Ahmed S. The Effectiveness and Experiences with Adaptive Online Team based Learning (TBL) Amid Social Distancing in Health Sciences. *Med Forum* 2023;34(9):145-149.doi:10.60110/medforum.340934.

INTRODUCTION

The Covid outbreak in 2019 impacted all teaching and learning activities due to social distancing¹⁻³. This stimulated the shift to distance education. Initial change was termed “transitional phase”, where training of faculty and students along with upgradation of hardware, played a vital part. Although there are several benefits of e-learning, one of the major hurdles was to maintain the interest of the students.

To overcome this problem, several innovative strategies were utilized to support student-centered activities.² Similarly, Team-Based Learning (TBL) was modified to adapt to the online mode of education. TBL is one of the key teaching strategies utilized worldwide in all fields.

TBL is a structured pedagogy known to support learning by engaging students in meaningful, problem-focused tasks in form of teams which is achieved through TBL, which supports and develops higher-order learning, communication skill development, professionalism, and steadiness.⁴⁻⁶ Software was developed to digitize TBL processes and procedures for delivery via computer- support, which are used increasingly and extensively in higher education.

TBL was adapted to change to e-learning. We started this study in 2020 when scarce data was present, and academicians were struggling to mold to this sudden change. However, recently few articles are published exploring the experience and validity of adaptive TBL conducted through virtual learning environments and video conferencing software.^{1-3, 7-13} One of the studies utilizing virtual learning systems for Team-based learning activities in nursing demonstrated improved students’ scores.¹⁴ Similar results were seen in Pharmacy and Medical students.^{1-3, 7-13}

¹. Department of Development Center / Oral Medicine² / IT³, Jinnah Sindh Medical University, Karachi.

⁴. Department of General Surgery, Dr. Ruth Pfau Civil Hospital, Dow University of Health Sciences, Karachi.

⁵. Department of Internal Medicine, Liaquat National Hospital, Karachi.

⁶. Department of General Surgery SU 2, Karachi Medical and Dental College, Karachi.

Correspondence: Dr. Sanaa Ahmed, Professor, Oral Medicine, Jinnah Sindh Medical University, Rafiqi HJ Road Saddar, Karachi.

Contact No: 0333-2924028

Email: drsanaaumair@gmail.com

Received: April, 2023

Accepted: June, 2023

Printed: September, 2023

In Pakistan virtual learning or e-learning is sparse among the medical institutes, with only exiguous online courses offered in the pre-COVID-19 era.¹⁵ To bridge this gap and provide immediate support to the students, we utilized several strategies including adapted Online TBL sessions to provide students with the opportunity to work in teams, motivate each other through active academic discussions and to enjoy the learning process.

MATERIALS AND METHODS

This was a descriptive cross-sectional study conducted on the Final year medical students of academic session 2020 Jinnah Sindh Medical University (IRB/2020/-367). A sample size of 177 was calculated from a population of 327 fresh students enrolled in the final year population of 327 fresh students enrolled in the final year MBBS with 95% confidence level with 5% chance of error through Creative Research Systems. After the permission of the Institutional Review Board, the researcher recruited the participants through convenience sampling which was done by emailing them link to Google Forms after completion of their online TBL activity. The link contains consent which on acceptance was followed by questionnaire of the study. The questionnaire consists of two sections. Section one contains questions about the software and Section two covers the satisfaction level of students with TBL session itself. A total of 177 responses were received from the students. The analysis was done through SPSS ver 23.

Final Professional medical students were divided into teams of 10 students in 32 teams and 7 students in one team making 33 teams in total. An orientation session of the online TBL was organized for the whole class three days before the session guiding them about the process and group discussion dynamics. The students were instructed to attempt the quiz “individual-Readiness Assurance Test(i-RAT)” at the start of the session. After that they were allowed to log in on Google Meet with their respective group to discuss the topic followed by the discussion time was completed, they were asked to solve the same questionnaire as a group. The result of the quiz was visible to all the students. The content expert facilitated the session and clarified the concepts at the end of the session.

RESULTS

The mean and the standard deviation were calculated for each subscale. All the students responded highest to questions related to the software used for the TBL while the standard deviation was highest for the TBL session-related questions.

Table 1 summarizes the responses of students according to sections. For Section 1, questions related to the software that is Google Meet were asked. The Overall response was positive regarding the ease of use and their overall experience. Stem 1 “I have used Google

Meet” highest response was multiple times (71.8). The second stem, “It is easy to use” was answered as Agree (56.5). For stem three, “I had difficulty using it,” the highest response was disagreed (57.6%).

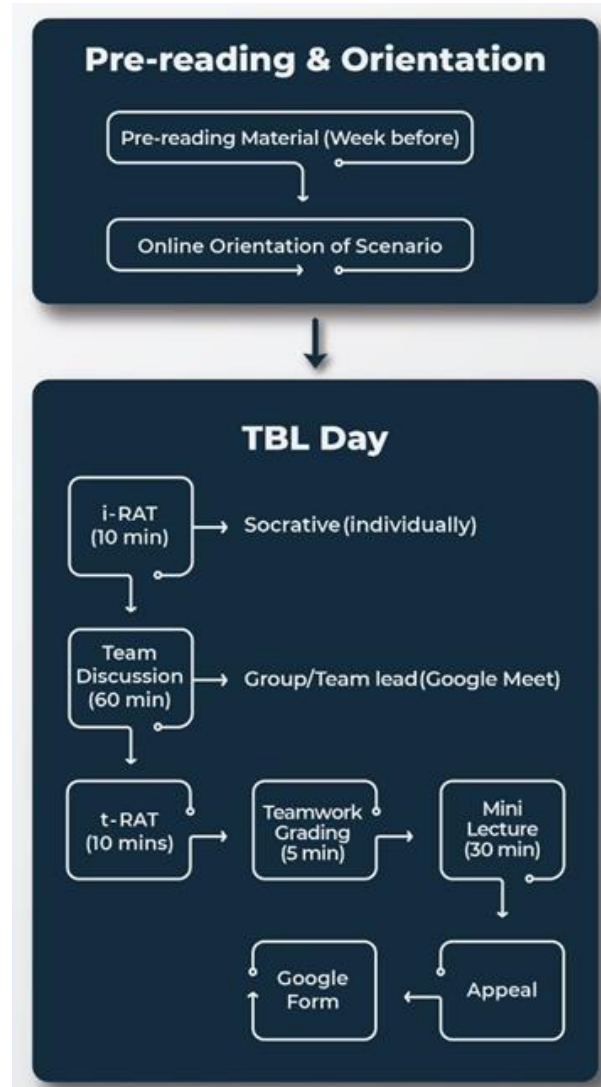


Figure No. 1: Team Based Learning Process Flow chart.

Table No.1: Mean scores for students on each subscale and overall composite means.

Subscale	Mean	Standard deviation
1. Software	3.9	0.77
2.Team-based learning	3.6	1.00

Table 2 consisted of 16 questions that covered their experience and attitude regarding team-based learning. Three of these items covered software related questions while thirteen items were based on their experience with the TBL process.

Table No. 2. Responses of Students in percentages.

S.#	Questions	Highest Response	Lowest Response
	I have used Google Meet:	Multiple Times (71.8%)	Never (1.3%)
	It is easy to use:	Agree (56.5%)	Not Sure (1.1%)
	I had difficulty using it:	Disagree (57.6%)	Strongly agree (1.1%)
	My experience communicating with teachers and colleagues was:	Good (42.9%)	Very Bad (0.6%)
	My experience working as a team online was:	Good (47.5%)	Very Bad (0.6%)
	TBL helped me to clarify my misconceptions:	Agree (50.8%)	Strongly Disagree (0.6%)
	It negatively affected my motivation to participate in the session:	Disagree (55.4%)	Strongly Agree (1.1%)
	It promoted a better understanding of the subject:	Agree (46.3%)	Strongly Disagree (0.6%)
	It improved my reasoning skills:	Agree (50.8%)	Strongly Agree (1.1%)
	It helped me to improve team working skills:	Agree (46.3%)	Strongly Disagree (1.1%)
	It helped in the self-assessment of my present knowledge:	Agree (65.5%)	Strongly disagree (1.7%)
	It reduced the amount of time needed for self-study:	Disagree (32.2%)	Strongly disagree (4.5%)
	It had a positive impact on my learning attitudes:	Agree (58.8%)	Strongly disagree (0.6%)
	It is an effective, motivating learning strategy:	Agree (60.5%)	Strongly Agree (0.6%)
	My satisfaction level with online TBL sessions:	3 (32.5%)	5 (3.4%)
	I would like to have future online TBL sessions:	Agree (46.9%)	Strongly disagree (0.6%)

DISCUSSION

The analysis of the collected answers demonstrated that the selected online medium was easy to use as more than 71% of the students were using it regularly for taking classes or communicating with family and friends. Hence, no training was required priorly by the facilitator or the participants. Section 2 covered the items regarding TBL as a teaching pedagogy, students' satisfaction, and experiences. More than 60% of the students agreed that their experience with online TBL was a motivating learning strategy. This is supported by a previous study conducted at a university in New Jersey, authors contrasted TBL with conventional teaching revealing that TBL is far superior as it improved the communication ability of the students and invigorated their eagerness to learn.¹⁰ While several studies are in support of its worth teaching problem solving and critical thinking skill to students which is shown as well in our results as when students were asked if their clinical reasoning skills improved 50.8% responded in agreement.¹⁶⁻¹⁸

Conducting TBL online during COVID-19 was a challenge, especially due to limited participants allowed in a single session in free conferencing software. During the design and permission of the study we did not come across any articles with similar design. It is only during the finalizing of manuscript we came across a published in "Medical Education Adaptation" section from Egypt discussing TBL sessions through another video conferencing software. Due to the limitation of the number of breakout rooms, they had to arrange nine meetings and to manage these sessions they

communicated time and protocol through WhatsApp groups. Around 96% of the students from that class attended the session. After the conclusion of the online-TBL, they disseminated a survey questionnaire to find out the satisfaction of students with this new method. Out of that only 50.7% of the students responded, showing 85% satisfaction with the teaching strategy.¹⁹ Comparing to our study, the software we used was Google Meet, which allows maximum of 250 students per call. Hence, we required two sessions to cover the topic in a large class of 327 students which was an advantage in comparison to the previous study. Further, we achieved our sample size completely receiving 177 responses from a class of 327. Also, the questionnaire was designed to cover both aspects of the activity that is software and experience with the activity itself and we found out the mean score for satisfaction with the software (Google Meet) was 3.9, while complacency with the session itself was 3.6 out of 5 which is overall good. Student's experience was further asked regarding motivation, communication, clarification of concepts, clinical reasoning skills, working as a team were all highest responses for good. Also, 58.8% of students agreed that it had a positive impact on their learning attitude. On the contrary when they were asked if their time needed to study was decreased, 32.5% responded in disagreement. 46.9% agreed to have future similar online TBL sessions which shows their openness and acceptance to the strategy. While, the overall satisfaction with the TBL session was 3 voted by 32.5% of the students which was lower in comparative to the study conducted through zoom citing approximately 85 percent students responded that they were satisfied with

the process but the rest of our results supports its overall good impact on the learning of the students and their satisfaction with the whole process.¹⁹

The result of the current study is in support of online TBL sessions. It was the first experience of the students and faculty with the online TBL session. Students are overall satisfied with the activity and would appreciate it in the future as well. The procedure we described was laborious to sort out at first due to substantial number of students but is advantageous for a teacher working with limited resources. Sorting of groups in the start of the session will decrease the hassle in subsequent sessions over the academic calendar. Hence, we suggest utilizing this simple method in the future as a student supported activity to improve the learning of the students in new norm of learning (post-covid era) where restrictions to limit the spread of disease require social distancing.

CONCLUSION

In conclusion, the findings of the study indicate that virtual Team-Based Learning (TBL) sessions were successful in attaining the desired learning objectives, such as fostering motivation, teamwork, communication skills, higher-order cognitive abilities, and concept clarification. Nonetheless, the constraint of scheduling these sessions for large groups exceeding 300 students represents a drawback, albeit in the context of limited resources and the current pandemic-related limitations, this modality remains a viable strategy to enhance students' educational outcomes.

Author's Contribution:

Concept & Design of Study: Syeda Zarreen Raza
 Drafting: Sanaa Ahmed, Ziyad Sanauallah
 Data Analysis: Zahid Ali Memon, Zunairah Rais, Shakeel Ahmed
 Revisiting Critically: Syeda Zarreen Raza, Sanaa Ahmed
 Final Approval of version: Syeda Zarreen Raza

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Jumat MR, Wong P, Foo KX, Lee ICJ, Goh SPL, Ganapathy S, et al. From trial to implementation, bringing team-based learning online—Duke-NUS Medical School's response to the COVID-19 pandemic. *Med Sci Educator* 2020;30:1649-54.
- Saverino D. Teaching anatomy at the time of COVID-19. *Clin Anat (New York, Ny)* 2020;34(8):1128.
- Wong P, Jumat MR, Lee ICJ, Foo KX, Goh SPL, Ganapathy S, et al. Redesigning team-based learning facilitation for an online platform to deliver preclinical curriculum: a response to the COVID-19 pandemic. *Med Ed Publish* 2020;9(135):135.
- Burgess A, Haq I, Bleasel J, Roberts C, Garsia R, Randal N, et al. Team-based learning (TBL): a community of practice. *BMC Med Educ* 2019;19(1):1-7.
- Michaelsen LK, Sweet M. Fundamental principles and practices of team-based learning. *Team-based learning for health professions education: A guide to using small groups for improving learning.* 2012:9-34.
- Swanson E, McCulley LV, Osman DJ, Scammacca Lewis N, Solis M. The effect of team-based learning on content knowledge: A meta-analysis. *Active Learning Higher Education* 2019;20(1):39-50.
- Al-Neklawy AF, Ismail ASA. Online anatomy team-based learning using blackboard collaborate platform during COVID-19 pandemic. *Clin Anat* 2022;35(1):87-93.
- Albarrak AI, Zakaria N, Almulhem J, Khan SA, Karim NA. Modified team-based and blended learning perception: a cohort study among medical students at King Saud University. *BMC Med Educ* 2021;21:1-8.
- Anas S, Kyrou I, Rand-Weaver M, Karteris E. The effect of online and in-person team-based learning (TBL) on undergraduate endocrinology teaching during COVID-19 pandemic. *BMC Med Educ* 2022;22(1):120.
- Carrasco GA, Behling KC, Gentile M, Fischer BD, Ferraro TN. Effectiveness of a Team-Based Learning exercise in the learning outcomes of a medical pharmacology course: insight from struggling students. *Naunyn-Schmiedeberg's Archives Pharmacol* 2021;394(9):1941-8.
- Govindarajan S, Rajaragupathy S. Online team based learning in teaching Biochemistry for first year MBBS students during COVID-19 pandemic. *Biochem Molecular Biol Educ* 2022;50(1):124-9.
- Miao JH. Adapting medical education initiatives through team-based e-learning, telemedicine objective structured clinical exams, and student-led community outreach during the COVID-19 pandemic. *JMIR Med Educ* 2021;7(2):e26797.
- Yu F, Wooster J, Yang T. Pharmacy students and faculty perceptions of online team-based learning due to the COVID-19 pandemic. *Pharm Educ* 2021;21:121-5.

14. Gomez EA, Wu D, Passerini K. Computer-supported team-based learning: The impact of motivation, enjoyment and team contributions on learning outcomes. *Computers Education* 2010;55(1):378-90.
15. Memon AR, Rathore FA. Moodle and Online Learning in Pakistani Medical Universities: An opportunity worth exploring in higher education and research. *J Pak Med Assoc* 2018;68(7):1076-8.
16. Figland WL, Blackburn JJ, Roberts R. Undergraduate Students' Perceptions of Team-Based Learning During an Introductory Agricultural Mechanics Course: A Mixed Methods Study. *J Agri Educ* 2020;61(1):262-76.
17. Kim H-R, Song Y, Lindquist R, Kang H-Y. Effects of team-based learning on problem-solving, knowledge and clinical performance of Korean nursing students. *Nurse Educ Today* 2016;38: 115-8.
18. McInerney MJ, Fink LD. Team-based learning enhances long-term retention and critical thinking in an undergraduate microbial physiology course. *Microbiol Educ* 2003;4(1):3-12.
19. Gaber DA, Shehata MH, Amin HAA. Online team-based learning sessions as interactive methodologies during the pandemic. *Med Educ* 2020;54(7):666.