

## COVID-19

# The value of team-based learning in a pandemic and five simple tips to get started

Melissa Hills 

Department of Biological Sciences,  
MacEwan University, Edmonton, Canada

## Correspondence

Melissa Hills, Department of Biological  
Sciences, MacEwan University,  
Edmonton, Canada.  
Email: [hillsm2@macewan.ca](mailto:hillsm2@macewan.ca)

## Abstract

Team-Based Learning (TBL) can be easily applied to different learning outcomes in various courses. This approach builds community and provides peer support for students in both in-person and online learning environments. When used for formative assessment, it can promote student learning while reducing the quantity of grading for instructors. Five simple tips to provide structure and flexibility for the successful implementation of Team-Based Learning are described using an example of a recent second-year principles of genetics course.

## KEYWORDS

assessment, covid-19, hybrid learning, online learning, team-based learning

## 1 | INTRODUCTION

Team-based learning (TBL) is useful for in-person, hybrid, or online learning and is flexible enough to accommodate pivots between these modalities. TBL can foster classroom community<sup>1</sup> and improve student satisfaction.<sup>2,3</sup> This is especially valuable during a pandemic that has isolated students and impacted their mental health.<sup>4</sup> TBL is an opportunity to develop students' ability to work constructively with peers while improving learning<sup>2,5,6</sup> and is suitable for different course learning outcomes.

When classes suddenly moved online in March of 2020, many of my students shared the impact of isolation and disconnection on their learning. In redesigning my lecture courses to be 'pandemic proof,' I prioritized opportunities for students to connect with peers by converting existing individual formative assessments to a TBL model. Below I identify five simple tips for getting started with TBL and describe how they were applied in my second-year principles of genetics courses for students to meet the course-learning outcome of applying genetic principles to solve problems.

### 1.1 | Tip 1. Set the teams up for success

An email was sent to students shortly before the first day to introduce myself and the course. Students were encouraged to share concerns or information relevant to their learning and identify preferred teammates.<sup>7</sup> The remaining students were randomly assigned to teams of 3–4 in the first week of class. The Team Contract (Section 1.3) was an introductory exercise for students to start working together.

### 1.2 | Tip 2. Connect formative team-based learning to individual assessment

Teams completed problem sets to practice applying their knowledge and received feedback to help with subsequent individual assessments.<sup>8</sup> The four TBL problem sets (16%) prepared students for four individual quizzes (20%) as well as the mid-term (10%) and final (10%). Additional course assessments included the team contract (2%), an individual learning reflection (2%), and an in-person weekly laboratory (40%).

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2023 The Author. *Biochemistry and Molecular Biology Education* published by Wiley Periodicals LLC on behalf of International Union of Biochemistry and Molecular Biology.

### 1.3 | Tip 3. Use a team contract for effective collaboration

The Team Contract provided a framework for students to develop practical skills in collaboration. It ensured that student teams established a work plan and agreed-upon expectations and consequences to mitigate common issues (Reference [9] and supplementary material)

### 1.4 | Tip 4. Build flexibility into the assessment plan

Students had a week to meet to work on the ~1-h TBL problem set. The lowest grade of the four TBL problem sets was dropped, which could include a 0, ensuring flexibility for missed assessments or uncharacteristically poor performance. Students had the option to work independently throughout or as a one-off for a specific problem set. All students chose to work in teams, and there were very few occasions where a student chose to work independently.

### 1.5 | Tip 5. Provide structure for students to develop skills in collaboration

An informal mid-term team check-in was scheduled where students were encouraged to revisit their team contracts and discuss their progress. Only one team expressed issues working together out of three sections (120 students), and they resolved these using their team contract with minimal support from me.<sup>10</sup>

## 2 | GENERAL REMARKS

I observed that formative TBL assessment supported students in learning to apply genetic principles to solve problems and allowed them to form important connections with peers. I also used this approach in a third-year genetics course to improve students' writing skills and in a fourth-year course to develop their ability to analyze primary literature. Student feedback about TBL was consistently positive at a time when many were frustrated with their learning experiences more broadly. TBL assessment quality was very good and supported students in satisfactorily completing individual assessments. Notably, the use of TBL allowed me to provide timely feedback to students while considerably reducing my grading load.

## CONFLICT OF INTEREST STATEMENT

This author declares no conflict of interest.

## ORCID

Melissa Hills  <https://orcid.org/0000-0003-3474-7973>

## REFERENCES

1. Parrish CW, Guffey SK, Williams DS. The impact of team-based learning on students' perceptions of classroom community. *Act Learn High Educ*. 2021;1-15:146978742110350.
2. Alamoudi AA, Al Shawwa LA, Gad H, Tekian A. Team-based learning versus traditional didactic lectures in teaching clinical biochemistry at king Abdulaziz university; learning outcomes and student satisfaction. *Biochem Mol Biol Educ*. 2021;49:546–59.
3. Altintas L, Altintas O, Caglar Y. Modified use of team-based learning in an ophthalmology course for fifth-year medical students. *Adv Physiol Educ*. 2014;38:46–8.
4. Copeland WE, McGinnis E, Bai Y, Adams Z, Nardone H, Devadanam V, et al. Impact of COVID-19 pandemic on college student mental health and wellness. *J Am Acad Child Adolesc Psychiatry*. 2021;60(1):134–41.
5. Eguchi H, Sakiyama H, Naruse H, Yoshihara D, Fujiwara N, Suzuki K. Introduction of team-based learning improves understanding of glucose metabolism in biochemistry among undergraduate students. *Biochem Mol Biol Educ*. 2021;49:383–91.
6. Swanson E, McCulley LV, Osman DJ, Scammacca Lewis N, Solis M. The effect of team-based learning on content knowledge: a meta-analysis. *Act Learn High Educ*. 2019;20(1):39–50.
7. Farland MZ, Feng X, Behar-Horenstein LS, Beck DE. Impact of team formation method on student team performance across multiple courses incorporating team-based learning. *Am J Pharm Educ*. 2019;83(6):7030.
8. Cauley KM, McMillan JH. Formative assessment techniques to support student motivation and achievement. *Clearing House*. 2010;83(1):1–6.
9. Hesterman S. The digital handshake: a group contract for authentic eLearning in higher education. *J Univ Teach Learn Pract*. 2016;13(3):26–109.
10. Burgess A, Roberts C, Lane AS, Haq I, Clark T, Kalman E, et al. Peer review in team-based learning: influencing feedback literacy. *BMC Med Educ*. 2021;21(Suppl 2):426.

## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

**How to cite this article:** Hills M. The value of team-based learning in a pandemic and five simple tips to get started. *Biochem Mol Biol Educ*. 2023; 51(3):325–6. <https://doi.org/10.1002/bmb.21713>