

## Remote Conversations To Enhance Class Experience in the Time of COVID: Co-Teaching with a Wingman Model

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Remote delivery poses numerous challenges, particularly for discussion-based classes. Here, we describe a class management model that uses a conversational approach between instructional coleaders to introduce topics and facilitate student discussions. The conversational approach enabled us to model various aspects of the scientific process, such as asking questions and generating hypotheses, aimed at an emergent subject, such as COVID-19. Students' feedback was positive, noting how the class enabled them to connect their existing knowledge with the daily influx of new insights about SARS-CoV-2. While our class focuses on COVID-19-related topics, this model of a conversational style class can be easily implemented for other course topics.

### INTRODUCTION

Many of us are adept in applying active learning approaches (1) in a face-to-face (F2F) teaching environment, where one receives immediate feedback on student excitement or total confusion, facilitating course reconfiguring and scaffolding “on the fly.” Remote delivery, where synchronous class meetings occur virtually, facilitated by video platforms such as Zoom or Blackboard, has many challenges, in part because such immediate feedback is lacking (2). As many of us experienced in the spring, remote delivery not only consumes a considerable portion of our daily mental bandwidth but also requires a substantial internet bandwidth, among other technological issues, as video feeds fail and the best-practice advice is “do not require cameras on” (3). An additional challenge of remote delivery during the pandemic is that, unlike prior semesters, where students taking remote or fully asynchronous online courses were doing it by choice (and thus may have preselected themselves based on motivation and ability to engage across platforms [4, 5]), the pandemic forced everybody into virtual classrooms. As the pandemic continues, we find ourselves asking the same questions as many others—how can we emulate our lively F2F class discussions during remote delivery? How do we design and teach a 100% remote course that engages students in elements of independent research, which has been shown to be highly beneficial to student learning (6–8),

without a framework and the supportive scaffolding of a F2F class? And how can we do it with an emergent subject, where scientific insights into the matter shift almost daily?

### PROCEDURE

To address these challenges, we designed a class around faculty co-led conversations, based in part on students' reading of primary literature and class-wide discussions of specific topics. This course focused on increasing students' understanding of the COVID-19 pandemic through biological, societal, and historical lenses, while simultaneously modeling diverse and inclusive ways in which scientists think and communicate about new and emergent issues.

Our course has four major components (Fig. 1). First, the class design is centered around specific themes for each week, with assigned readings to prime the discussions. “Big ideas” (examples in Fig. 2) are primarily “umbrella” questions currently at the forefront of scientific and popular discussions and thus facilitate nuanced conversations about various aspects of these topics. Second, as coleaders, we generate a conversational synergy that engages the students and encourages them to participate. By seeing us asking questions of one another and working through answers and ideas using our different and complementary expertise, students gain an appreciation for how scientific discussions are structured, emphasizing that thinking through the problem step by step is more important than merely blurting out the answer. Students also learn that even scientific experts may struggle with questions and that there are no easy answers as science is unfolding before our eyes. Although students are not together in the same room, the round-table conversation approach is an effective icebreaker, sup-

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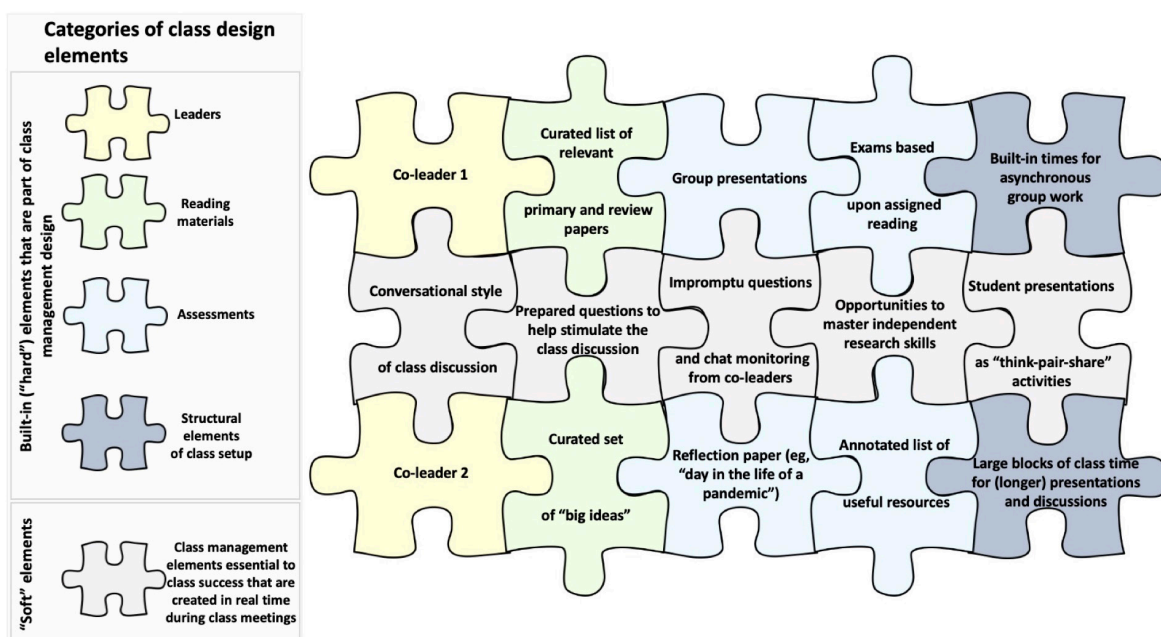


FIGURE 1. Overview of "hard" and "soft" elements behind the class management design of the conversational class. Built-in ("hard") categories include instructors, a curated list of reading materials, assessments, and scheduling elements. The resultant "soft" elements are organically created during class meetings and contribute to class success.

porting and encouraging students to jump in at any point of the discussion. Third, our class structure facilitates both in-class and after-class interactions among students as they begin to practice scientific thinking on their own. Students are split into small groups of three or four; each group chooses the presentation topic depending on the interests of its members. Fourth, the course dedicates protected blocks of time (1.5 to 2 hours) for in-class presentations, group member interactions, and uninterrupted class-wide discussions. These time blocks are analogous to prescheduled "think-pair-share" activities (9, 10).

On Day 1, we introduce the big ideas and potential questions (Fig. 2) and co-lead students' discussion in a loosely supported ("free float") mode, where we ask the first few questions to break the ice and then follow the students' lead. Students read scientific papers in advance, are prepared for discussion, and demonstrate a mastery of concepts in short online assessments. This approach fosters the students' ability to contribute to and participate in the discussion and to ask questions to delve more deeply into the subject. Days 2 and 3 of each week are dedicated to students' presentations (15 slides for 15 to 20 minutes), followed by open discussion. We note that, in the few cases when different groups present on the same topic, the topic is approached from different and complementary perspectives, thus expanding the overall breadth of covered content and leading to lively discussions. Students appreciate that they are free to pursue and present topics of greatest personal interest while also contributing to the overall learning experience of the class.

We believe that having two instructors and a conversational atmosphere are key ingredients that enable and foster student engagement and understanding. Moreover, our daily discussions offer students many examples to emulate in their own presentations and questions. Similar outcomes may potentially be reached where one of the coleaders is a graduate teaching assistant or an advanced undergraduate student. Having faculty representing different disciplines and/or subject areas to co-lead a conversation may offer an extra interdisciplinary dimension to the class. Furthermore, having faculty coleaders with different identities (such as race and gender) serves to model equitable discourse and diversity in STEM. The nature of the conversation will also be influenced by the individual teaching styles of coleaders, again, providing students with multiple means of understanding the topics under discussion.

We do not have formal assessment data of how well this coleaders ("wingman") approach works compared with a more traditional format with a single instructor. Such assessments may include (i) rubrics in which students evaluate their peers' presentations on both content and delivery, (ii) pop-up quizzes that are based on concepts from student presentations and in-class discussions to evaluate whether students' understanding of the material depends on the mode of delivery, (iii) pretest and posttest comparisons or student reflections, or (iv) contrasting students' understanding with and without the wingman approach. An academic self-efficacy scale (11) can also be used to evaluate students' comfort with various aspects of a scientific discussion and which elements of the class may have contributed to improvements.

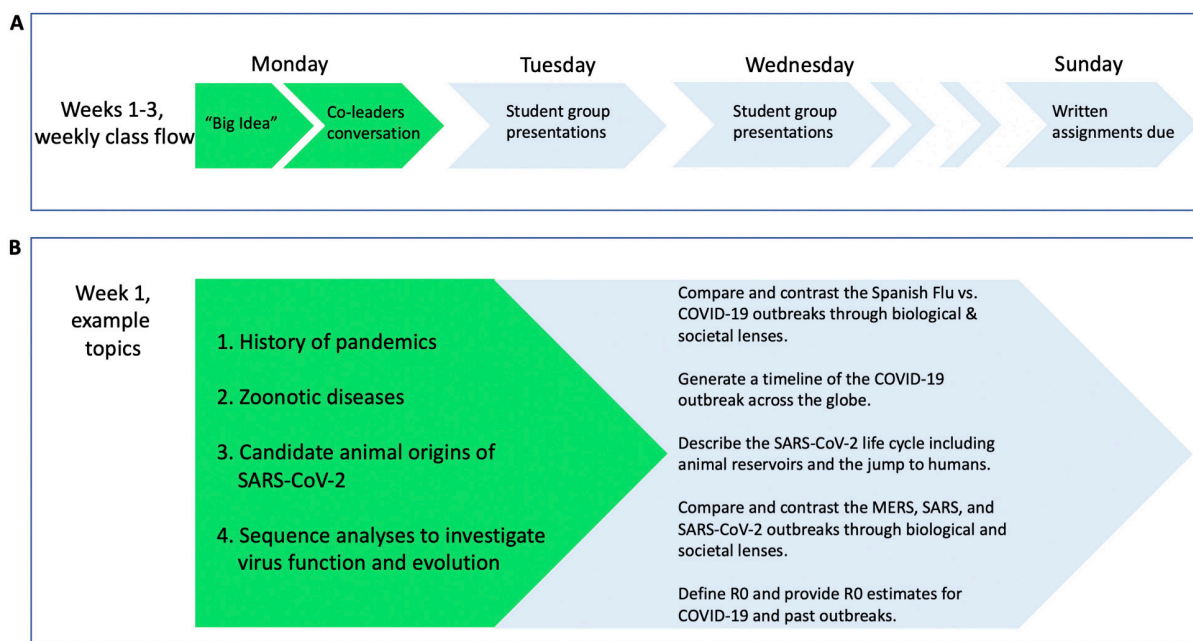


FIGURE 2. Example overview of weekly class flow, including class tasks and due dates (A), and example “big idea” topics for a single week of classes (B).

## CONCLUSION

We designed and implemented a 100% remote course for upper-division biology majors to increase their understanding of the biological and societal impacts of the COVID-19 pandemic. This discussion-based class of 24 students used a conversational approach with coleaders to introduce and help students expand their learning with scaffolding. Student feedback was positive, highlighting their appreciation of being able to link biological knowledge of the SARS-CoV-2 virus and societal impacts of the COVID-19 pandemic to their own experiences and perspectives in real time. As discussions of campus reopenings began, students noted that the knowledge gained in this class equips them to become “ambassadors” on campus, able to provide their peers, friends, and families accurate information on the viral biology, vaccine development, importance of physical distancing and hygiene, and placement of this current outbreak in the history of pandemics. While our class focuses on COVID-19-related topics, we envision that a similar conversational style can be easily implemented for any future course topic, whether online or F2F, as long as the scaffolding questions are provided.

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