STEM - FIT

FORUM FOR INCLUSIVE TEACHING

04/19/2021

CONCEPT

Best Practices for Breakout Rooms

Achieving participatory equity, defined as "a fair distribution of participation and opportunities to participate within the learning and teaching process," can be challenging when instruction is online [1]. In this edition of STEM-FIT, we continue to explore the Community of Inquiry (CoI) Framework, highlighting NSM faculty striving to cultivate social and cognitive presence through equitable and meaningful online learning experiences.

In the Department of Biological Sciences, Drs. González-Orta, Lindgren, Lopez, Bendorf and Hughes have a creative approach for Zoom breakout room discussions in their microbiology lab courses. While students may not be engaged in hands-on experimentation in the virtual setting, faculty can use breakout rooms to help cultivate and refine professional skills, including problem-solving and collaboration. Importantly, breakout rooms can foster collaborative problem-solving and help students find community and connection in the virtual platform. Nationally, students have reported increased anxiety or otherwise negative experiences in breakout rooms. Fortunately, providing guidelines and structure can alleviate the infamous breakout room awkwardness [2].

TIPS AND TOOLS

Faculty teaching the upper-division microbiology courses featured here are applying the following general structure to their breakout room activities:

- A lesson is introduced in a synchronous online tutorial.
- Breakout rooms of 3-4 students are asked to solve a problem based on the lesson.
- PowerPoint slides, designed ahead of time, are assigned to each group. The slides include data and/or prompts that groups work to resolve.
- *Structure*: Students assume four different group roles – the Recorder, Reporter, Facilitator, and Team Captain. In keeping with the commitment to inclusivity, the Team Captain's role is to ensure that each member of the group is granted space to participate.

Some additional guidelines:

- Early in the semester, students are randomly assigned to breakout rooms.
- Later in the semester, students choose their teams, especially when group work is assessed, and/or when groups are working on a multi-week project.
- Instructors never visit breakout rooms unless invited. Instead, they type suggestions and positive comments in a separate textbox on the group's slide in real-time.

Examples of Problem Sets

BIO139: *General Microbiology* lab:

A) Disease Detective.
Lesson: Students are introduced to different types of growth media and the types of bacteria that grow on each.
Breakout rooms: Each group is given a patient scenario. They must discern the cause of the infection, determine which media to use to confirm their diagnosis, and predict the results they should get using their selected media.

B) Journal Club.
Lesson: Students learn about Horizontal Gene Transfer (HGT) and are given a research article on *Vibrio cholera* that uses HGT.
Breakout rooms: Each group is given a figure from the research article and asked to answer a set of questions and to formulate their own conclusions based upon the data provided.

C) Course-based Undergraduate Research Experience (CURE).
Lesson: Students are introduced to testing methods used to characterize single-celled organisms, like bacteria.
Breakout rooms: Students are given data sets generated by students in 2019 who used various methods to characterize bacteria isolated from the American River. Students are asked to discern the 2019 results and formulate conclusions about the bacterial isolates. At the end of several virtual lab periods, the students use their results to identify the genus and species of their American River isolates using dichotomous keys and biochemical data tables.

BIO140: *Medical Microbiology& Emerging Infectious Diseases* lecture:

A) Applications related to the current pandemic.
Lesson: Students are asked to watch the documentary *"Spillover—Zika, Ebola & Beyond."*
Breakout rooms: Students are given prompts asking them to relate the issues of previous outbreaks to our current pandemic. They are then tasked with formulating recommendations for preventing new spillover viruses from becoming the next pandemic.

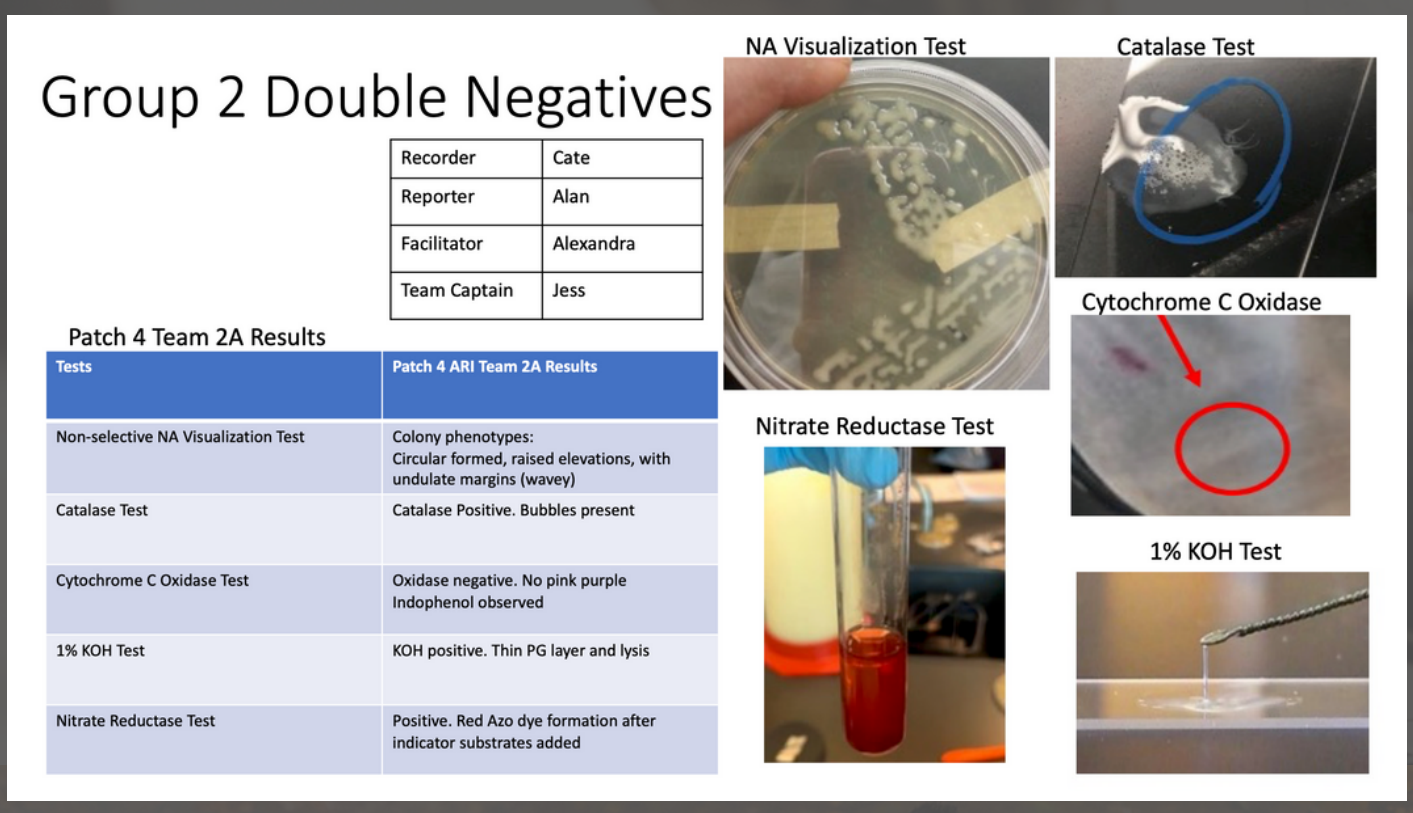
BIO 145: *Diversity of Microorganisms*:

BIO145 is a Tiny Earth Network course, where students investigate the diversity of bacteria in the soil and mine for antimicrobial properties.
Lesson: Students engage in case studies to understand the ethical considerations of bioprospecting and its relationship to biopiracy.
Breakout rooms: Students engage in activities to learn how to analyze genetic and collection data from prior semesters and look for trends on what types of bacteria have been collected on the Sacramento State campus.

Comment from Student about Group Work:

"*Dr. Gonzalez-Orta made group work more fun than I thought it would be. I typically do not like working in groups because I find that not all members do their share of the work. However, Dr. Gonzalez-Orta structured the group work in a way where everyone has to participate in order to have a conclusive presentation of the material."*

Example of a group slide produced in a breakout room



RESOURCES

1. Reinholz, D. L., Stone-Johnstone, A., White, I. Sianez, L. M. & Shah, N. (2020). A pandemic crash course: Learning to teach equitably in synchronous online classes. CBE - Life Sciences Education, 10 (4).
2. McMurtrie, B. Teaching: How to make breakout rooms work better. (2020). The Chronicle of Higher Education.