Teaching in Stereo: Strategies for Class Participation

Derek Bruff

Educator and Author, Agile Learning

Teaching on Zoom showed many faculty that having students participate using their voices isn't the only meaningful kind of participation. How can we take a more inclusive, accessible approach to class participation in our classrooms, whether they're virtual or in person? In this whitepaper, Derek Bruff considers principles and practices to turn classes into learning communities where students can learn from and with each other.

This whitepaper has been adapted from an original presentation by Derek Bruff for Macmillan Learning.

Introduction

Creating inclusive environments for all viewpoints

When we hear sounds, our brain relies on input from both ears to establish the directionality of the sound. Similarly, when we see something, our eyes rely on the dual input from both eyes to create a whole image. Our eyes and ears function in the same way that **stereoscopes** do, using two inputs to create a clear, complete output.

Photogrammetry takes the theory that multiple, varied inputs create a complete output a step further. In photogrammetry, a user takes multiple (often hundreds or thousands of) pictures of a single object from varying angles. Those perspectives are then combined to create a three-dimensional model of the object. With each additional perspective, the object becomes more clear and more focused.

We can apply this same theory to our classrooms. When we create a classroom that allows for all perspectives to be shared and heard, our class will become complete and dynamic. In an average college class, 5-8 students account for 75-95% of classroom discussions; this is the default participation dynamic, regardless of class size. Furthermore, these 5-8 participants tend to be of a type: often, it is those who have previous experience in the subject matter, or it can tend to male students and white students. If we are only ever hearing from one small fraction of students, we have lost an opportunity to learn from varying perspectives and opinions. **The photogrammetry perspective on classroom inclusion argues that creating structured ways for students to learn from and with each other can enhance the overall learning experience**

The Medium

For many professors, "Zoom learning" during the pandemic helped us find new ways to encourage student participation. We realized that there are many ways that students can contribute to a conversation that goes beyond volunteering an answer or opinion verbally. Once we start to explore these new methods, we will invite new voices into the conversation and create a more inclusive classroom environment.

In-class polling

In-class polls are a great way to set the stage for a conversation. They allow for full participation from all students by providing an opportunity for everyone to weigh in and share their opinions in a safe, non-judgmental and, if need be, anonymous format. Rather than just asking for students to raise their hands to respond, which can alienate or induce anxiety in students, the poll allows for full participation and therefore invites more perspectives and opinions to be included in the discussion. This helps to create a more inclusive and diverse conversation, ensuring that all students have a chance to be heard.

Types of questions that can be asked in a poll (multiple choice):

- **Misconception Questions** - when you can anticipate that students already have a misconception about a topic and would like to address it
- **Representation Questions** - demonstrate understanding of a concept by identifying the correct representation (mathematical to visual, most commonly)
- **Critical Thinking Questions** - these may not have one answer, but usually do have a "best" answer
- **Counterfactual Questions** - also thought of as "what if" questions, these involve applying what you have learned to imagine an imaginary scenario

iClicker is not limited to multiple-choice questions. Given that students are responding on their own devices, polls can also ask students for more advanced responses, such as:

- **Long-form responses:** For example, "Draft an intro to a blog post on the Viegenere Cipher." This can help instructors to get an idea of how students would start an essay, and identify any immediate problem areas.
- **Visual organizers and group brainstorming sites:** "Google Jam Board" is a great tool for seeing students' ideas visually as they work. This program offers color coding, graphic organizers, and various note-taking formats. Online Jam boards allow instructors to monitor group work as students collaborate. It also provides insight into how students think, process, and work toward a final product.
- **"Ready-set-go" questions, or "waterfall":** This model can be done with a poll, or with any kind of interactive chat. The instructor (or TA) first poses a question, and students type out their response *without* sending it. Then, when all students' responses are ready, the instructor will tell them to send their responses *at the same time*, resulting in a "waterfall" of student responses. Because students are answering at the same time, their responses will not be influenced by other students' opinions. To further remove the fear of judgment or influence, iClicker offers an "anonymous mode," so that the responses themselves remain anonymous. In this model, students are most likely to be fully honest.
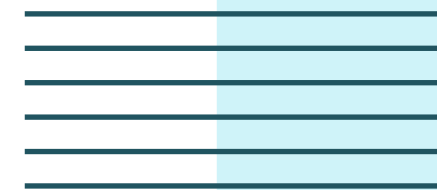
Acknowledging the "backchannel"

Implementing digital tools such as polling software in the classroom increases awareness of the "backchannel," or students/teaching assistants who are frequently contributing behind the scenes and might go unnoticed in the classroom. Also referred to as the "voice of the chat," these students offer support to others in the form of:

- Notetaking
- Sharing resources
- Commenting on others' posts
- Amplifying unheard voices or ideas
- Asking and answering questions
- Offering suggestions
- Building community
- Physically opening and preparing the classroom

While many of these duties might be preassigned to specific students or teaching assistants, there are students in each classroom that develop an interesvt in these responsibilities. Implementing digital tools allows for this "behind the scenes" support work to be recognized and encouraged.

The Structure

It is important to implement different class activities that allow students to respond in a variety of ways. Which activities you chose will depend on the specific grouping of students in your class and the demands and objectives of the class. A structure that was particularly successful with one class might not work as well with another, and the instructor should be prepared to be flexible and accommodating with the class structure.

Below are samples of class activities that work well to increase class participation and allow for diverse voices to be heard.

1. **Ready set go / "Waterfall":** detailed above, this activity encourages *all* students to respond openly and honestly, and removes the anxiety that often comes with class participation

2. **Think-pair-share:** this activity follows a simple routine that can be adjusted for the needs of each class. First, instructors ask students a question and give them time to think about it independently. Then, students find a partner to discuss the question with. Finally, the pairs share the results of their discussion with the class. This activity allows students to hear a variety of opinions, and to share their thoughts in a low-stakes environment (with just one or two other students) before bringing their thoughts to the class. It also allows for more processing time before the question is discussed whole group.

for 30 seconds	turn to your neighbor	with the whole class
for 1 minute	walk across the room	with another group
during class	group size =2	verbally
before class	group size= 3 or 4	in writing
THINK	**PAIR**	**SHARE**
Ask students to respond to a quesion independently.	Have students compare answers in small groups.	Ask students to share their work with the class.
with pen and paper	come to consensus	via polling software
or a laptop	agree to disagree	via whiteboard
as you doodle	explain your reasoning	class discussion
	share your opinion	time for telling

3. **Jigsaw:** This activity involves two rounds of group work. In the first round, each group has a different task. In the second round, one student from each of the first groups meets to apply their learnings to a new problem. This activity requires participation from each group member, as everyone is considered a representative of their original group. Therefore, each student holds an important role, as no one else in their second group will come with the same knowledge.

Round 1 - Focus Groups
Divide students into groups and give each group a different text to reat and discuss.

1	1		2	2		
1	1		2	2		
3	3		4	4		
3	3		4	4		

Round 2 - Task Groups
Mix the groups so that students can bring their specific focus to a common task or problem.

|				
1	2		1	2
3	4		3	4
1	2		1	2
3	4		3	4

4. **Fishbowl:** in this activity, only a few students are identified as participants, while the rest of the class is assigned to be observers. Those participating in the discussion sit in the middle, while the observers sit on the outside. It is important to switch up the students who are in the fishbowl each time this activity is used, to give all students equal opportunities to participate and observe. This activity is particularly beneficial to the observers, as they don't face the usual pressure of deciding when/if they should share their opinions; their only job is to listen and learn from others, which relieves the social pressures of class discussions. It is also possible to hold a Fishbowl on Zoom, by hiding the cameras of those who are observers.

Students in the fishbowl discuss the topic or reading at hand.
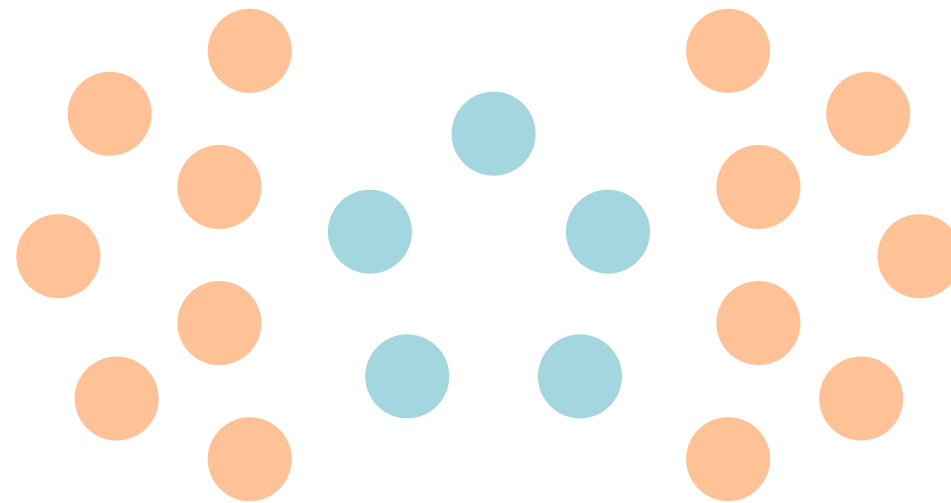
Students outside the fishbowl observe and reflect on the discussion.
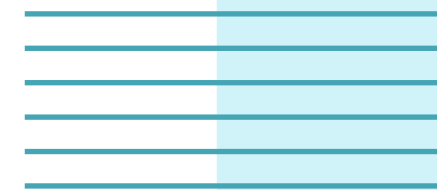
5. **Structured Reading Groups:** this model gives every student a role in a text discussion. In this way, structured reading groups are Interdependent groups, in that they only function if everyone fulfills their role. When students know that they have an important role within a group, they are more likely to be active participants. Some roles that students can hold in these groups are:

    • Discussion leader: guides the discussion and keeps the group on task
    • Passage master: find key quotes for discussio
    • Devil's advocate: tries to disagree with the author or find alternative opinions
    • Creative connector: finds connections between readings and topics in the course/outside of the course
    • Reporter: records the discussion and reports the key findings back to the whole group

6. **Peer Instruction:** This model is similar to the think-pair-share activity, but also involves polling. First, students respond to a question posed by the instructor. Then, the instructor analyzes the responses to decide on next steps. Depending on the results, the instructor can decide to move forward (if students are mostly correct), divide students into a think-pair-share (if students are divided), or go back to reteach (if students are mostly incorrect).
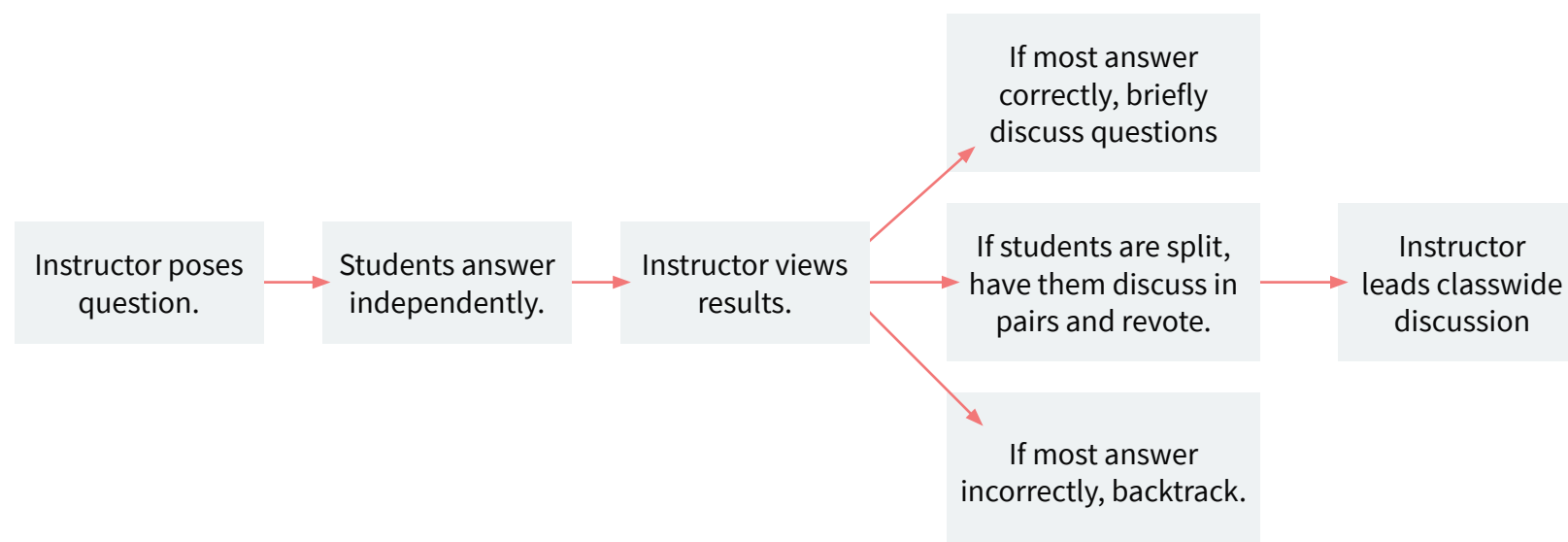
7. **Gallery Walk:** In this activity, students wander the class and respond to prompts posted about the room. This allows for movement, which can promote better thinking and higher levels of participation. At the end of the activity, students and instructors can revisit the prompts to read and reflect upon others' responses.

Ground Rules for Inclusive Teaching: how do we make sure that everyone is respected?
It is important to have this conversation with students at the beginning of a class, to ensure that everyone understands and is prepared to follow these rules.

- Listen respectfully, without interrupting
- Allow everyone the opportunity to speak
- Criticize ideas, not individuals or groups
- Avoid inflammatory language, including name-calling
- Ask questions when you don't understand; don't assume you know how others are thinking
- Don't expect any individuals to speak on behalf of their gender, ethnic group, class, etc.

Derek Bruff

Educator and Author, Agile Learning

Derek Bruff is an educator and author. He directed the Vanderbilt University Center for Teaching for more than a decade, where he helped faculty and other instructors develop foundational teaching skills and explore new ideas in teaching. Bruff has written two books, Intentional Tech: Principles to Guide the Use of Educational Technology in College Teaching (West Virginia University Press, 2019) and Teaching with Classroom Response Systems: Creating Active Learning Environments (Jossey-Bass, 2009), and he was producer and host for the educational technology podcast Leading Lines.

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