

Fishbowl Discussion

The AIM force and motion summer workshop included an interview between workshop facilitators. Because the interview was conducted in a central location and observed by all workshop participants, and because participants were also invited to share questions and thoughts at the end of the interview, it is referred to as a fishbowl discussion. The main motivation for including this fishbowl was to explicitly describe how the “teacher moves” used by the facilitators support learner construction of target ideas, clarifying the benefits these actions can provide for the participants in their own classrooms. The fishbowl was conducted on the 4th day of the 5-day workshop, after participants had ample opportunities to experience the guided-inquiry approach employed. The facilitators planned much of the substance of the questions and responses prior to the fishbowl so that they could adequately reflect on it and determine areas of priority. A summary of this conversation, in which facilitators discuss how the elements of the guided-inquiry approach translated into facilitator practices, appears below.

Question 1: What do you pay attention to during the “What do you think?” part of the activity?

The facilitator should be aware of the ideas that arise during a lesson, how many different ideas exist, and how to paraphrase those teacher ideas. Furthermore, s/he needs to consider whether the salient teacher ideas are known misconceptions for a given topic. As misconceptions/ideas come out during discussions, the facilitator must be cognizant of whether they will be addressed later in the activity. If a misconception will be ameliorated over the course of the lesson then the facilitator should ignore it. However, the facilitator must make a judgment on how to proceed if the misconception will not be addressed.

Question 2: What might you do with a misconception that you know will not be addressed in an upcoming lesson?

If the facilitator identifies a misconception that will not be resolved, s/he could potentially adapt the discussion near the end of the lesson to address it. For instance, s/he might ask a new question during the discussion of the activity to bring out the misconception. On the other hand, if the activity does not explicitly address the misconception, the facilitator could pursue two paths: 1) Ignore it completely or 2) Speak to the individual(s) with the misconception. While neither path is ideal, the facilitator must consider their priorities (e.g., time) when making these decisions.

Question 3: What do you do if there is only one idea expressed in the “What do you think?” section?

Again the facilitator must consider several options for how to proceed. In the instance where *all* participants are thinking in a manner consistent with the scientific understanding, the activity may be very short, but the facilitator should still check for understanding. Conversely, if *all* participants are thinking in a the facilitator should ensure that all misconceptions “come out.” If the facilitator overhears a deep misconception (e.g., “forces transfer between objects”) that has not been shared by the group, s/he should bring out the misconception in some way. For instance, the facilitator might recommend that participants “artificially” state the misconception as such “Well I’ve heard that other people say that a force stays with an object. What do you think about that?”

Question 4: How would teachers find what misconceptions are likely to come up in a given activity?

The facilitator should direct participants to resources such as research articles or summaries that highlight misconceptions for a given topic. It should be noted that certain content areas (e.g., Force and Motion) may have more thorough research on student thinking and misconceptions. The guidance that accompanies the instructional materials also includes relevant misconceptions for each investigation.

Question 5: When you have these different points of view that are expressed come out, how does that help with the activity?

Opposing viewpoints can be very motivating to participants and often promotes discussion that can further their understanding of a topic. One facilitator emphasized his love for opposing viewpoints:

I love to create controversy. That is the best motivator when people see that there are people in the room who think differently than you. The desire is there to find out if I'm right or if they're wrong. That really gets people's juices flowing.

Question 6: During the implementation of the activity, what are the things you're looking for? What are you doing as the instructor to make sure things go the way you want them to go?

Most importantly, the facilitator should be circulating the room and attending to what is happening among the participants. Are they on topic? Do they need more time? Are they discussing the evidence relevant to the observed phenomenon? If participants are off track, for instance, the facilitator could help by “focusing people’s attention on where the relevant evidence is, not what the relevant evidence is, but focusing them on where to find it.” Facilitators should also ensure that all equipment/materials are working as intended. It is also essential to monitor participant progress during each activity, as the varying content knowledge among participants may allow some groups to finish faster than others.

Question 7: What do you do when either, different groups are getting very discrepant data from each other, or the whole class is getting something that you didn't expect them to get?

First and foremost, the facilitator should avoid marginalizing scientific evidence by asking questions like “Well, what do you think *should have* happened?” Even though participants might be producing anomalous data, this could be used as an opportunity to emphasize the scientific process. For instance, the facilitator might ask “Well, we have a bunch of different data. What should we do about that?” to begin a discussion about how scientists would resolve this problem.

When considering the logistics of the activity, the facilitator should assess why the activity did not work correctly and make the necessary adjustments. Furthermore, the group could decide to repeat the activity or seek additional methods to answer the research question.

Question 8: What might you do if one group is getting something different from the other groups?

The facilitator should discuss how scientists agree with the claim that is supported by evidence. Additionally, if time allows, the discrepant group(s) might be allowed to repeat their procedure or observe another group's data collection to ensure they are doing the activity correctly.

Question 9: What is the role of whiteboards in your instructional process?

The whiteboards create a “shared representation of space” that requires participants to negotiate what they will present on their whiteboard. These negotiations will likely bring out disagreements and foster engaging discussions among group members.

Question 10: When you ask people to share results you sometimes ask for volunteers, but other times you ask specific groups to share. Why do you do that?

When listening to group discussions, the facilitator should be forming a general impression about the ideas and misconceptions among the participants. As a result, subsequent discussions can be tailored to address discrepant viewpoints and/or misconceptions. For instance, the facilitator could select a group with a discrepant idea—without making it obvious they're the only ones with that idea—to share with the group. Similarly, groups with opposing viewpoints could be purposefully selected to foster discussion. Choosing specific groups will also reduce the peer pressure (i.e., fear of stating incorrect response) that may prevent certain groups from sharing their ideas during discussion. If all groups are thinking in a scientifically appropriate way, the facilitator could still have specific groups share ideas, which would allow the group to move on after they realize they're in agreement.

Question 11: At the end of an activity when you're pulling everything together, are there things you're doing or looking for during that phase of instruction?

First, the facilitator should resolve any remaining controversy among the group by facilitating discussion/debate among the participants. The facilitator should guide the discussion appropriately, remembering to restate teacher ideas when necessary to ensure that each point is clearly understood. Once everyone agrees, the group can move on to the next activity.

If a discussion becomes interminable and counterproductive, the facilitator might have to wrap up without resolving all disagreements. For instance, s/he might say something like “Well, this is what *most* people think so we can move on.”

Ideally, the facilitator should tailor the discussion so participants are the authority and move forward only when the group reaches consensus on disagreements/issues. This may be a daunting task, but the Force and Motion materials (and implementation guide) are intentionally designed to aid in achieving that goal.