Supporting Student Participation in Discussions

To create a classroom community in which learners are able to communicate effectively with each other, teachers must support their students' participation in mathematical discussions. Educational researchers in mathematics suggest that teachers enhance meaningful participation in mathematical discussions by

- *encouraging student conjectures.*
- *asking for explanations and evidence from students.*
- *focusing on the process of problem solving and the reasoning behind it.*
- *providing students with opportunities to compare methods, solutions, and explanations.*
- *engaging students in developing arguments to support their mathematical statements.*
- *asking students to paraphrase each other's statements and structuring activities so that students seek to understand each other's methods.*

Carolejo Li, a Kindergarten teacher, begins the year with many of these ideas in mind. Here she describes her efforts to create a mathematical community in which all learners participate and are able to listen to and build on each other's ideas.

Creating a math community in a Kindergarten classroom is challenging yet rewarding. One strategy I use in my classroom is to develop a discussion format that allows me to include and validate all of my students' ideas. I see these discussions as essential for bringing out the mathematics in the *Investigations* activities. I also see them as essential in helping students learn how to communicate their own mathematical thinking. This communication piece is a big part of helping my students see themselves as mathematicians and a big part of helping our class become a community of mathematicians.

One of my first conversations every year is about counting. Every morning we count the students in our class to determine how many students came to school that day. At the beginning of the year, there are always some students who don't apply one-to-one correspondence yet. Also, some students can count accurately when they are doing the counting, but when they observe another student who does not use one-to-one correspondence, they don't quite see where the inaccuracy comes from.

One year I decided to have a conversation about counting. I started with a simple question, "What is counting?" I really wasn't sure what I would get in response, but I decided to try it and hoped I would be able to shape the conversation into something valuable for everyone. Over the years I have restructured this discussion and now it goes something like this: I count the students that day as usual, but I do it wrong (usually without one-to-one correspondence). The students all react quite strongly. Then I let them describe what I am doing (they love to do that) and what I need to do to count accurately.

Somehow this discussion ends up being one where the students don't have to raise hands and everyone listens to each other. Ideally, I would like this to happen for all of our discussions. I feel that the best conversations that we have in my classroom are the ones that just flow—no one has to raise a hand to speak and everyone listens to each other. In fact, at times my interjections are minimal.

Because counting is our first discussion of the year, I make sure anyone who wants to say something has an opportunity to do so and that every idea is validated in some way. This conversation sets the tone that one of the things we talk about in our classroom is math and that everyone has important thoughts to contribute.

Another type of mathematical discussion we have is based on the question "What do you notice?" I use this question to launch a new activity or to wrap it up. I love asking this question because there are no wrong answers, and I am often very surprised by how sophisticated my students' observations can be. Initially, I get more responses than I would with a more specific question that has a correct answer. As time goes on, I often get almost the whole class raising hands to respond to this question. I think that my students feel safe in these discussions because they realize that their ideas are important. I try to be very careful about how I respond to their observations and do so in a nonjudgmental manner. I usually repeat or rephrase what a student offers. I often ask if anyone wants to respond to an observation. Sometimes I will just make a list of observations. Most of the time we will launch from an observation into a discussion about the observation. I believe the last of these approaches helps my students feel like their ideas are valuable. A student or a group of students offers an observation, and then we have a rich discussion centered on that observation.

I feel that creating a class of students who can share observations, share strategies, and discuss topics—all centered around math—is a process. We are always working to hone our communication skills in this manner, but in the end we look back in amazement at all the math we have learned over the year.

In this case, Ms. Li shares how she begins the process of teaching her students to participate in mathematical discussions. Her strategies include planning discussions that flow from open-ended questions and facilitating conversations that encourage student-to-student talk. Ms. Li recognizes that the art of successful mathematical discussions develops over time. As the year goes on, she continues to engage her students in mathematical conversations, giving them plenty of opportunity to practice and build on the important skills they are learning.

Questions for Discussion

1. **How does Ms. Li's use of open-ended questions like "What do you notice?" help foster a supportive environment for discussion in her classroom? What other strategies does she use to help her students develop into a community of math thinkers?**

2. **In what ways do you foster conversations in a whole-group setting? How do your strategies help all students feel they are a valued and important part of the mathematics community in your classroom?**