

## Building and Modeling How to Build a Community of Learners

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### **Abstract**

*This article describes how to build a classroom community of learners, pre-service teachers, during the first days of the semester. This process not only creates a supportive learning environment, but it provides pre-service teachers with a model of how they can build a community of learners in their own classrooms.*

### **Introduction**

In the past, when I taught mathematics courses for preservice teachers, I struggled to create a classroom environment where even the shyest students shared and justified their ideas, took risks, and challenged each other's thoughts and work. To realize the full potential of the mathematics learning embedded in tasks, I knew a classroom atmosphere that supported mathematical inquiry, risk taking, and higher order mathematical discourse needed to be created (Erickson 1999; Marcus & Fey 2003; Rasmussen, Yackel and King 2003). Having students work in groups on worthwhile tasks, modeling good questioning, and providing support as a facilitator sometimes was enough to create this environment. However, the semester was often well underway before the class resembled a learning community, and I could step back from my role as cheerleader for the environment. I wanted to create a collaborative atmosphere from the first day of my courses, but thought it should happen organically. After some reflection and insight, I learned a valuable lesson. If I wanted to create a community of learners at the onset of a course, I needed to dedicate time at the beginning to build the foundation for this environment; classroom learning communities don't often cultivate quickly organically. The article that follows describes how I intentionally build a supportive classroom community of learners during the initial days of the semester. This process not only helps to create a supportive learning environment, but it provides the preservice teachers with a model of how they can build a community of learners in their own classrooms.

### **Creating Course Norms**

Each semester, I begin with an activity developed to create course norms. Because they are the class's norms and not my norms as a facilitator, I believe the preservice teachers should participate in the process of creating the norms and have ownership of them. To help the students consider what they need from each other in order to feel supported and comfortable to take risks and share their ideas, I ask them the following questions: "What do you want others to know about you as a learner of mathematics? What supports you when you are doing mathematics in a group? What do you need from others in order to share your ideas? What do you not want others to say or do?" I provide examples of what I consider essential norms, like maintaining a positive attitude,

allowing everyone to share their ideas, and respecting others' thoughts and ideas. Each student is then given small sheets of stick-on notes to record their responses to these questions, writing one response per sheet. After having time to reflect, the students share their responses in small groups of three to five, which provides them a safe platform to discuss their fears, needs as learners, and beliefs about mathematics and learning mathematics. The stick-on notes allow them to join those similar or shared responses. The groups then report out, and as a class, we use the responses to discuss and create our list of classroom norms. The shared fear of mathematics and of being wrong always arises as does the need to give others sufficient time to think about a problem or question before sharing their ideas. At the following class, I give the students a sheet that contains our norms, and we begin this class by having each person (students and instructor) read the norms out loud. I then discuss the importance of maintaining the norms and allowing everyone to feel supported and safe, so we can do our best work as learners of mathematics. I also note that this list shouldn't be put in their folders and forgotten. To be true to it and ourselves as learners, we have to reflect on it often and continue to evaluate how well we are maintaining our norms.

### **Community-Building Mathematical Tasks**

After creating our norms, we are ready to jump in and do some math! My goal for the first few tasks I present to the students each semester goes beyond having the students doing mathematics (Stein & Smith 1998) and developing a deeper understanding of the mathematics and focuses on communicating about mathematics with each other. An ideal task promotes both mathematical thinking and communication among all of the students. For my number systems course, I use an activity, adapted from Bresser and Holtzman's (2006) "Guess My Number" in *Minilessons for Math Practice*, that I call "Guess Your Number?" I stick one number on each student's back (e.g.  $\frac{3}{8}$ ,  $\pi$ , 0, -5, 2.1). They are then given the directions to ask everyone in the class one yes-or-no question to gather information about the number with the end goal of deducing the number on their back. Because the course focuses on the real number system and its subsystems, this activity provides a great gateway into the mathematics of the course. Halfway through this activity, I stop the students, and we discuss their questions and what makes a question a good one for this activity. Usually someone will introduce the idea that the questions that eliminate large groups or sets of numbers are the most helpful and then give an example, such as asking if it is an odd number, an even number, positive, or negative. Most of the students follow the discussion with more thoughtful and intentional questions. Beyond thinking about the mathematics, each student in the course discusses mathematics with every other student in the course and becomes comfortable communicating about mathematics with the others. Even though the task is simple, it is quite beneficial in terms of building a community of mathematics learners.

Another task, Math Meetings (Driscoll 2001), that I often use in my algebra course is adapted from Driscoll's professional development materials on fostering algebraic thinking. It is a variation of the common Handshake Problem. To introduce this task, I give the students the following directions:

Each person in the room is going to talk with everyone else one person at a time. You are to find and record one new shared math fact that is true for both people. Shared math facts encompass a lot. For example, one shared fact could be that you both

really like geometry or that you both are observing in a seventh-grade math classroom. After you have recorded your math fact, find a new person and discuss your shared math fact. You are not to reuse facts. For example, Maddy can't use the fact that she enjoys math with two different people.

After everyone has discussed their math facts with one another, I then pose the following extension:

Each person in the room should have talked with everyone else and discussed and recorded their shared math facts. How many distinct facts have been recorded all together as a whole class? For example, if Riley and Carter recorded that they both like algebra, and Eric and Cole recorded the same fact about themselves, consider these facts to be distinct because they are about different people.

The students then work in groups of two to three to come up with a solution to this problem. The discussion that follows focuses on the numerous ways to solve it and on understanding and making connections to each other's methods and ways of thinking. This task allows the students to experience algebraic thinking, which is a great introduction to the course. Moreover, during this task, the class begins to build a sense of trust and community, and students are given another chance to discuss their beliefs and experiences about mathematics teaching and learning with their peers.

The third community-building task, Getting to Know Colleagues: Uniquely Us, is taken from Rubenstein, Beckman, & Thompson's (2004) *Teaching and Learning Middle Grades Mathematics*. This task is perfect for a preservice teacher course focusing on data analysis. In groups of three or four, students collect information about each other. The following lists some of the suggested information: mathematics classes taken in high school or college, movies watched about mathematics, experiences working with middle grades students, other teaching or field experiences, experiences tutoring, shared beliefs about mathematics, etc. I recommend that the students focus on topics related to mathematics and teaching and learning mathematics. They are asked to find and record unique and interesting ways that the group members are alike and different and then to use this information to create a Venn diagram with intersecting circles, one for each member of the group, to present to the rest of the class. A brief review of Venn diagrams is often needed. When each group presents their diagram to the entire class, each person discusses how they were different from the other members of their group, so that everyone in the class is required to share their uniqueness. Again, the beauty of this task is that it initiates a sense of sharing and respect for everyone's ideas while still maintaining a high level of mathematics. Students are not only doing mathematics (many often come to the realization that a Venn diagram is a meaningful way to display data for the first time ever); all students share and discuss their ideas from the start.

### **Concluding Thoughts**

Creating classroom norms together, discussing students' fears of mathematics, and intentionally choosing inclusive tasks that allow all students to communicate about mathematics are effective ways to build a supportive, powerful learning environment that encourages students to take risks and share their ideas, conjectures, and insights without fear of ridicule or embarrassment. Moreover, continuing to model effective practices is essential to maintaining this safe environment. Having students explain their thinking, asking a student to paraphrase another's insights or build on their ideas, making sure

everyone is justifying ideas with mathematical reasoning, valuing mistakes and misconceptions as important learning opportunities, and reminding students of the course norms are all ways to maintain this mathematical learning community. Modeling, reflecting on, and discussing ways to create this supportive learning environment are also essential aspects of a mathematics course for preservice teachers who one day are going to cultivate such an atmosphere of mutual respect in their own classrooms.

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