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Building a Culture of Acceptance in the Inclusive Mathematics Classroom

The ability of students to learn mathematics with understanding relies on a classroom community in which all students are expected to learn through active participation, and teachers provide support to engage all students in mathematical tasks.

The work of Stigler and Hiebert (2009) in reporting on the Trends in International Mathematics and Science Study (TIMSS) video describes features of inclusive mathematics communities in which all students are learning to make sense of mathematics. The videos from Japanese classrooms show teachers who include confusion and frustration as part of the learning process, give students time to sort through what puzzles them, and offer support as needed. The Japanese teachers who were videoed welcome differences in the class because they often lead to a range of ideas that provides an entry point for discussion and reflection. All students are given the opportunity to learn the same mathematics, but teachers understand that

different strategies will make sense to different students, and that not all students will learn the same things from each lesson.

Like the Japanese teachers in the TIMSS, the teachers who have contributed to this book create a culture of high expectations and acceptance of differences in their classrooms that facilitates the learning of mathematics. They make sure their students know that they are expected to take responsibility for their own learning and support one another as learners. Further, they expect their students with special needs to learn along with their peers. They create a culture based on respect and acceptance of differences in which students feel safe to take risks and to admit frustration and confusions. In fact, one teacher refers specifically to taking risks when she calls on children to discuss their strategies. When she calls on a child, she asks, "Do you want to take a risk or do you want to wait?" If someone makes a mistake, she might say, "Don't feel badly if you make a mistake. Many of you find this problem difficult." Finally, these teachers provide multiple points of entry based on their observations of what has worked for the different learners in their class.

Teaching for understanding in an inclusive mathematics classroom is not easy. Many teachers did not learn to make sense of mathematics when they were in school, and the process of learning to teach in this way is complex. Ms. Walker, an early childhood teacher in an urban school system, writes passionately about her own negative experience as a mathematical learner, how she was made to feel that she couldn't ask questions and couldn't learn mathematics. She describes how she is determined to create a supportive atmosphere and recognize the strengths of all of her students.

Voices From the Field

A Teacher Confronts Her Math Anxiety

I am a teacher in an inclusive classroom in a large public school system where over 80 percent of the children are students of color. Our classroom is a community of learners, and we try and develop the individual talents of each of our students. I have taken on the job as my personal responsibility to see the light in each one of my students no matter where they are from or what challenges are before them.

Mathematics is a subject that I've always liked, but as a student I remember that I was afraid to approach the teacher and ask for help. I didn't want anyone to know I didn't fully understand what was going on. In high school, our math classes were tracked and I remember being in

“dumb” math, as we labeled it—the class with the students who needed more time to understand. In college I took a math course for teachers who were to teach math at the elementary level and did horribly. I asked the professor for help this time, but he made me feel so inadequate that I was not willing to ask for support again.

At the beginning of my teaching career, I was nervous about being in front of young children and teaching math. The pain of my personal story kept appearing. I was able to get them to memorize and regurgitate whatever I was telling them. This “worked” for a few years until I began taking courses for the math curriculum that I needed to teach. I found out that not only did I have to know the content, but, in addition, I needed to know how my students were learning math ideas. It was a learning experience both for me and my students. I learned from math coaches as I watched them teach lessons and processed the lessons with them. They helped me navigate the curriculum for my students, and they guided me to understand the math for myself. I built up my confidence and have spent a great deal of time analyzing my work. The teaching of math has become so important to me that I try to be involved with as many opportunities as I can to share ideas. I continue to learn about how young children understand math in order to help them build a mathematical foundation based on developmentally appropriate concepts. In contrast to my own experience of isolation and anxiety in math class, I create a mathematics community in my classroom that is based on testing out ideas, asking questions, feeling safe to make mistakes and learning from each other.

Through her own experience as a teacher, Ms. Walker came to learn the pleasure and importance of making sense of mathematics and has worked hard to create a culture of sense-making in her own class that is very different from her own experience learning math.

Recognizing Differences and Supporting Strengths

As indicated in the examples from Japanese classrooms, recognizing differences among students can be an opportunity to surface both a range of solutions and confusions. To celebrate differences, they must be acknowledged so that both the teacher and the students can support and learn from each other. The following classroom examples illustrate teachers who make a point of including everyone in ways that both recognize differences and use student strengths as avenues for learning.

When she was a new teacher, Ms. Gordon hadn't yet learned to acknowledge student differences in a way that supported learning. Here she describes the beginning of her journey and reflects on the consequences of not being explicit about learning differences and the supports that different students sometimes need.

Voices From the Field

"It's Because We're Bad at Math."

My first attempt at differentiating math instruction was a disaster. I was a teaching intern, and our third graders had been working on addition. A little more than half of them were confidently adding two-digit numbers, and the rest needed help developing strategies.

The solution was simple. After our mini-lesson, I'd split the class in two. I would work with the kids who already had solid strategies, helping them to show and extend their thinking. The rest of the class would go with my mentor teacher, Anne, to the adjoining room. Together, they would work more on understanding place value and breaking up numbers by 10s and 1s.

I stood in front of the class and explained the plan. "So, Thomas, Eden, Olivia, Mark, and Sarah, please take your folders and follow Anne." At that moment, Sarah's body stiffened and her eyes filled with tears. She looked up at me with an angry, hurt expression. "Why do they get to stay?" she asked. "Why do we have to go in the other room? It's because we're bad at math. It's because we're stupid."

Every student turned to look at me, and I had no idea of how to respond to Sarah's accusation. I fumbled, trying to explain. "No, of course not. People learn in different ways . . . we can do a better job of teaching you . . . small groups will help . . ." I had unwittingly realized one of a teacher's greatest fears. I had made a student who was having difficulty feel like a failure. I had confirmed her suspicion that one group of students was "good at math" while another was "bad at math" as clearly as my teachers had when they put struggling learners in the back of the class when I was young.

There were several problems with my approach that day. First, I publicly announced who would be in what group without explanation of the purpose. Second, by sending one group to another room—which I had wanted only to minimize distractions—I had physically segregated my class for the remainder of the math period. I had presented no opportunities to move from one group to another. Third, and most important, I had sprung this new structure on our class with no discussion about learning differences, no expectation that different students sometimes needed different amounts of help and support.

Sarah had drawn a logical conclusion from my actions: I didn't believe she was smart enough to work alongside the rest of the class. I had confirmed her long-held fear that she was simply "bad at math."

As we will see in the next section, Ms. Gordon learns an important lesson from this incident that leads her to think carefully about how she wants to create a supportive classroom community.

Ms. Thompson, a teacher who has high expectations for all of her students, expresses her philosophy as follows: “I believe in making public the things that are difficult for all of us, myself included, as a way of teaching empathy and support in the classroom.” She organizes her math class with set routines that work for everyone, including Michael. Michael, a student in her fourth-grade class, responds well to a structured environment. He needs and wants clear and consistent routines, and becomes anxious if he is uncertain about what to do either academically or socially. Ms. Thompson and Michael thus developed strategies to diffuse his anxiety, ones that were clear to him and to the rest of the class. She included his classmates in openly acknowledging his differences and enlisting their cooperation in helping Michael feel comfortable, while also making them aware of his strengths.

Voices From the Field

Lessening Anxiety and Supporting Learning

In order for Michael to make sense of mathematics and, ultimately, become a successful mathematics student, I had to create a learning environment where he could feel safe and comfortable in all aspects of the day. I set up daily routines for the class. Typically, we started math with the students sitting on the rug, each with a white board, a pen, and a paper towel. I posed problems for students to solve on the whiteboard.

We developed strategies to help Michael when he became anxious or frustrated; for example, we would suggest he take a walk in the hall and not reenter the room until he was “ready to work.” When he was having trouble working with a partner or when he had made a small computational error, I would question him, as his third-grade teacher had, “Is it really that serious?” Once these strategies became routine, Michael became less apprehensive in math class and was able to work more productively.

As he progressed through his fourth-grade year, I came to more fully appreciate Michael and his learning style. I recognized what worked for him and, more important, Michael began to grasp the expectations of the classroom and understand that they also applied to him. I believe that this was a key component for Michael finding success. In earlier grades, he had grown accustomed to lower expectations than the rest of the

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class, and knowing this added to his feeling of “I can’t do it.” By raising the expectations and slowly teaching him the skills to meet these expectations, I started to see that Michael was making progress, and even more important, he began to see his own progress.

Fully accepting Michael by acknowledging his strengths and contributions as well as his needs is an important component of the inclusion model of our school. The teachers at Montgomery are explicit with our students that fairness means giving people what they need, not giving everyone the same thing. To put this into practice, I had conversations with the whole class. For instance, we discussed how we could help our friends if they get upset. Sometimes I had conversations with a smaller group of students about specific issues related to Michael and other students, such as, “How can we help Michael get out of his negative behaviors? If we feel we can’t handle it, what do we do?” Michael’s classmates learned about the ways that he became frustrated and they were able to support him. They were patient with him and patient with me when I needed to spend time with him, and several students were able to redirect him before he became overly anxious and acted out. Both the students and Michael could see that by lessening his anxiety, he was able to contribute strategies and ideas to our math conversations that benefited everyone.

Another teacher, Ms. Neal, makes a point of including all of her students in math conversations, recognizing situations in which they can make positive contributions with her support. For example, she calls on Sam, one of her students who struggles with cognitive flexibility, when she sees his hand raised to share a strategy. If he gets off track, she brings him back by asking, “How did you begin?” To bring other students into the conversation, she might ask, “Who began the same way?” When choosing someone to read a math problem out loud, she thinks about Kevin, a student who has some special needs, but who is an outstanding reader.

Both Ms. Thompson and Ms. Neal address the differences of their students by supporting them and finding ways that allow their successful participation in classroom mathematics.

Making the Classroom a Safe Place

Students with special needs often have not had positive experiences in school. They may be reluctant to contribute, fearful of making mistakes. As Ms. Walker reveals through her own experience, this anxiety is

not conducive to learning math. Often a self-fulfilling prophecy results: the more the student does not contribute, the more likely expectations for the student's performance are lowered, which in turn, lowers the student's self esteem. These teachers spend a great deal of time in the beginning of the year making explicit the code of conduct in the class that will make everyone feel comfortable. When students find their classroom to be a safe place to make mistakes, to ask questions, and ask for help, then they are less likely to hide their confusions and struggles and to reach out and accept the assistance they need. Ms. Thompson defines her own role with the children to make it clear that she is there to help students learn:

I want to know who is stuck at home tonight so I can help you Monday. That's my job. If you do your homework with someone and they do the work, I won't know if you're stuck, and I'll move on and you'll be more confused.

We return to Ms. Gordon as she continues her journey to establish a classroom community that acknowledges and supports differences so that students are comfortable expressing confusion and asking for help.

Voices From the Field

The No-Secrets Math Classroom Part 2

Today, extra help is an expectation—not an exception—in my classroom. After a whole-group mini-lesson, I subtly pull aside the students I know need help—sometimes, but not always, including special education students—and I let the class know what's going on. "At the round table, I'm going to do some more problems like this with a small group. If you'd like some help getting started, please come join us." Typically, between two and four additional students will join in. And it's not always the same students. Even high fliers—kids I wouldn't suspect of having difficulty—will come to the small group to clarify a question or to gain confidence in a new skill.

Students feel comfortable doing this in part because we've had conversations since the beginning of the year about learning differences.

Ms. Gordon: So far this year, we've talked about different school tools that kids need to be successful. Who would like to share about a tool they're using?

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Samantha: I am using a pencil grip because it makes my handwriting neater. [Half a dozen students give Samantha the “me too” hand signal. This happens as each student shares.]

Josh: I use a slider to help me in reading so I don’t lose my place.

Harry: I have a private office space so I can focus and not get distracted.

Madeleine: Some kids have checklists for checking over their work.

Ms. Gordon: That’s right. We know that kids need different tools to be successful. Because we’re all different people! People also need extra help sometimes when something is hard for them. Think for a moment, and put your hands on your knees if you can remember a time when you needed help. [I pause while students think. Just about everyone puts their hands on their knees.] Raise your hand if you’d like to share what you remember.

As students share, it becomes clear that everyone needs help sometimes (even teachers). Then I make my teaching point:

This year, I and the other teachers in our classroom will give extra help to kids during math. Does this mean that the kids I’m helping aren’t good at math? Absolutely not. When we put in effective effort and time, we can achieve anything. You will all be challenged this year, sometimes in math, sometimes in reading or writing or making good choices, but you will all be successful.

The message, *effective effort plus time equals success*, is a constant theme in our classroom. So when I ask students to join us if they need extra help, they do, and that extra help carries no stigma, no feeling of being “bad at math.” We have no secrets in our math classroom. Because we talk about it, everyone knows that new ideas come quickly to some and more slowly to others. Everyone knows that different people have different strengths. And everyone knows that we all need help sometimes, and that it feels good to get the help you need.

Ms. Gordon’s ability to reflect on her own practice leads her to create a learning community in her classroom in which students feel comfortable acknowledging areas for improvement and asking for help in order to work toward their learning goals. By making

everyone's needs public, she creates an entry point for discussion and for support. She shifts the responsibility for learning to the students instead of preassigning groups.

Promoting Responsibility

An emphasis on responsibility that teachers like Ms. Gordon promote represents a sharp contrast to the "learned helplessness" that affects students with special needs when adults who work with them "tell them what to do." When adults simply tell them what to do, they see learning as outside of themselves and, as a result, are not familiar with grappling with problems and trying to make sense of the mathematics. Students who take responsibility for their own learning are more likely to learn math with understanding because they are more likely to rely on their own knowledge instead of the knowledge of others. Teachers who promote responsibility promote both individual responsibility and responsibility for other students in a community of learners.

Even the way the classroom is physically organized can communicate to students the importance of shared responsibility. When students are organized in groups of four and desks are faced toward each other, it can facilitate their academic and casual conversation within all subject areas. Students can also develop a sense of ownership within the classroom through jobs and leadership roles to create an environment in which they are forced to take care of the classroom together. Some classroom jobs that promote student ownership of their own mathematics learning include team leaders whose job entails telling other students their tasks and managing student collaboration, before or after school, and homework checkers whose job entails checking homework every day. Further, some teachers assign students a day during which they take charge of the morning meeting when they discuss content objectives of the day.

Ms. Robinson lets her fifth graders know that they need to build a strong foundation in fifth-grade math for their middle school "house of math." She tells the class,

Your job is to have a solid fifth-grade year. I don't know you're struggling if you don't tell me. Everyone is a math person. They "rock" in some areas, but they may struggle in some areas. Where do I struggle? You should be asking yourself that. My job is to make you rock.

When Ms. Robinson teaches, the students who need help gather on the rug. She works with her “rug rats,” as she affectionately calls them, some at the beginning of the class, some come later if they’re stuck. If she is circulating, students hold up three fingers if they need her, and one finger if they have something to share. When students help each other, she urges them to ask questions, and give examples, but not to tell the answer because that is not helping. Before a test, she writes two sentences on the board: *I believe in you. Do you believe in you?* After a unit, she asks students reflection questions: Was the unit easy? What made it easy? If it was hard, what would have made you understand it better? Ms. Robinson’s approach makes the goals of math class clear to her students, and they understand both her role and their roles. Asking for extra help is a built-in routine of her classroom, and students take the initiative to seek support.

Acknowledging Frustration

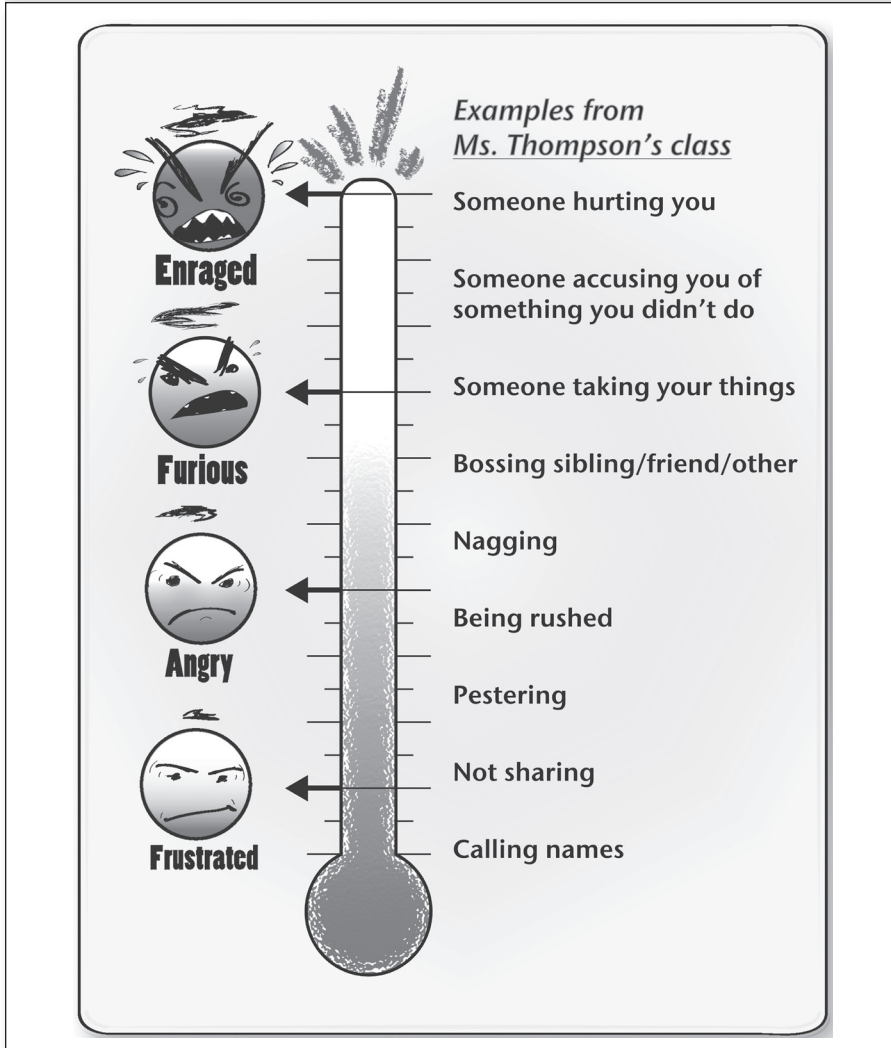
Students who struggle with mathematics can become frustrated. Although a certain amount of frustration can promote learning, when frustration leads to various degrees of anger, this clearly impacts their ability to learn. It is important, then, to face these feelings of frustration and anger openly and to work on ways in which students can regulate their responses.

Ms. Thompson helps her students regulate their behavior with the use of an “anger thermometer” (see Figure 1.1). The anger thermometer is created as a whole class and is different for each class she teaches. It is important that the anger thermometer include ideas that are meaningful and organic to the particular students she is teaching.

Ms. Thompson creates a visual representation of a thermometer with different lines and categories matching particular items with appropriate responses. For instance, being rushed might lead to frustration while someone physically hurting a student might make that student furious.

Although the whole class creates and refers to this representation, the anger thermometer is particularly effective for those students who need the most help with self-regulation. This anger thermometer serves as a gauge for students to recognize if their reactions were appropriate or if they were in fact overreacting. Oftentimes, when students feel they are struggling or find themselves getting confused or unsure, they may overreact. They may get very upset and shut down. They may become furious when in fact it is something that is only worth being frustrated over. The thermometer may help students

Figure 1.1 Anger Thermometer



recognize that furious reactions are appropriate for when someone is hurting them or taking their things, not for needing extra help with a math problem. At times during math class, Ms. Thompson just points to the anger thermometer if a student has become frustrated, and the student is able to express a more appropriate response.

Summary

The chapters that follow include many of the principles and strategies introduced here. The teachers who have contributed to this book strive to establish a community of learners in their mathematics

classrooms in which all students are expected to and can learn. As Ms. Gordon's class theme—*effective effort plus time equals success*—indicates, these teachers expect and work hard to engage everyone in making sense of mathematics. Rather than hide student differences, these teachers acknowledge them and structure their classrooms to provide support. Asking for help is not a stigma in these classrooms, it signifies that students are taking responsibility for their learning. The examples in this chapter reveal the purposeful choices these teachers make to build their community, whether it's Ms. Thompson's anger thermometer, Ms. Robinson's rug rats, or Ms. Gordon's round table. Teachers such as Ms. Walker and Ms. Gordon acknowledge the complexity of the task at hand and reflect on their own teaching; there are no easy solutions to addressing diverse student needs in an inclusive classroom.