

Democracy's College

Episode 16: Responsive Mathematics Pedagogy

Welcome to the Democracy's College podcast series. This podcast focuses on educational equity, justice, and excellence for all students in P-20 educational pathways. This podcast is a product of the Office of Community College Research and Leadership, or OCCRL, at the University of Illinois at Urbana-Champaign. Learn more about OCCRL at occrl.illinois.edu.

In this episode, Chauntee Thrill, from OCCRL, talks with Dr. Jennifer Banks, Coordinator of Mathematics and Science at Washtenaw Intermediate School District (ISD), about responsive mathematics pedagogy.

Chauntee Thrill: Good afternoon. Would you share a little bit about your background with listeners about Washtenaw ISD and the Responsive Mathematics Institute?

Dr. Jennifer Banks: Definitely. Washtenaw Intermediate School District is the regional education service agency in Southeastern Michigan. We provide services focused on teaching and learning to support 14 districts in our area. An integral part of our mission is to enhance the achievement of every student. Specifically, our vision is focused in on equity, inclusion, and social justice. The Responsive Mathematics Conference was developed in an effort to help meet that vision. The Conference seeks to help mathematics educators critically reflect on their instructional practice. It is our hope that through this reflection educators will begin to understand their own identities, the biases they bring in expectations for their students, and understand how that may enhance or impede students' opportunity to master mathematics. While the Conference focuses on math educators, the content can be applied across disciplines. We have actually incorporated literacy education as a part of our work. We have had renowned speakers in the area of mathematics, literacy, and culturally responsive pedagogy, including Dr. Walker from Columbia University and Dr. Ernest Morrell from the University of Notre Dame.

Chauntee Thrill: Great. Thank you. Can you tell us what is responsive mathematics, and how is it different or similar to culturally responsive pedagogy?

Dr. Jennifer Banks: So, responsive mathematics, I would argue, consists of culturally responsive pedagogy, but it also includes a strengths-based framework as well as a placed-based education. We call it responsive mathematics because we are trying to come up a way for teachers to meet the needs of every student that sits in front of them. In general teach to the middle—that isn't always every kid. Our whole point in coming up with responsive mathematics was to help teachers understand the importance of the context of the learning environment. At our last session Dr. Warren defined culturally responsive pedagogy as a set of outputs rather than a set of inputs. We look at that, kids that have culturally responsive pedagogy are academically successful, they are culturally competent, and their socio-political awareness is there as part of their instruction. We believe that all those three pieces are a key part of responsive mathematics. Students also know that their teachers genuinely care about them, and not just about them as a person, but about their cultural background, and about their families, a genuine sense that they are valued in the classroom. That ties in with the strength-based framework. We have been using Dr. Morrell's and Pam Allyn's book, *Every Child Is a Super Reader*, which is a fantastic book. They have a very complex strength-based model that we have kind of added to the definition of responsive mathematics.

Chauntee Thrill: Thank you. So how does identity influence one's perception of math?

Dr. Jennifer Banks: So our identity is developed as a result of our experiences in the world. Hence both our positive and negative experiences in the math classroom, our home environment, influence how we interact with math. So during the first session of our conference, Dr. Walker discussed the importance of understanding our mathematics narrative. So what is our story? How do we get to either develop a love or a semi-hate for mathematics? What role did our parents play, what did our peers play, and what did our teachers play in the development of our mathematics narrative? So our mathematical identity is deeply influenced by how others perceive us to be, as well as our own individual perception about our ability to be successful with mathematics. I remember as a high school teacher I would have kids say: "Oh my mom is not good at math"; "nobody in my family is good at math." And so they have taken on that identity that "I can't be good at math either." So before we even get started kids have already kind of said: "Oh that's not for me." So helping to change that narrative to say: "Well yeah, my mom may not have been good at mathematics, but I kind of get it." Changing the way we view ourselves.

Chauntee Thrill: Thank you. So talking about teachers for a second, how does bias and privilege impact the mathematics teacher's pedagogy?

Dr. Jennifer Banks: So, bias and privilege is all that baggage that we bring into the classroom. Right? And I would suggest that the bias and privilege that we bring imposes our expectations for students, what we think students are able to do, how far we can push students, and just even how we teach math in general. For example, I am a teacher who always is of the frame that I should let students explore. Yes, I need to give them some things, some guidance, but kind of let them explore, play with the math, and see what happens. In my experience, I saw that students began to develop the algorithm that I could have just given to them in the beginning. When I made them come up with it, it stuck versus if I just gave it to them, wrote on the board, and made them copy it down, it didn't seem to stick as well. So realizing that when we talk about bias and privilege our perception of what kids can do or even how much they understand mathematics influences: (1) how we teach, and (2) how far we push them. So my assertion in developing this conference is to really begin to help teachers reflect on the biases and privilege that they bring to the math classroom and help them to really begin to critically reflect on how those biases and privilege enhance or impede students' opportunity to learn, students' opportunity to develop a love for mathematics. I think a lot of mathematics teachers, at the secondary level, we're pretty confident in our math knowledge, and for some, maybe not all, it is a love; it is fun to do. How do we share that same excitement with our students so that our students develop that same love for math?

Chauntee Thrill: Great. Thinking about the actual mathematics classroom, what are some of the strength-based instructional models that can be implemented?

Dr. Jennifer Banks: Using Pam Allyn and Dr. Morrell's book, *Every Child Is a Super Reader*, they identify seven strengths in helping students learn how to read. I think those strengths still apply in the math classroom. The first is a sense of belonging and helping students realize that they do belong in the math classroom, that math is a part of them and they can be good at it. It's not the scary classroom where I don't understand anything, and the teacher just writes a bunch of stuff on the board, and there is no connection to my life. So establishing that.

The other is curiosity. How do we foster curiosity in the math classroom? Math, in my sense, by definition is problem-solving. There is always a question for math. How do we help kids see that and pull that out? And that curiosity is what helps or can help to foster a love for mathematics.

The other is friendship. In this work as well as in my previous work, my dissertation, I found that kids tend to think that math is done in isolation, that we sit at our desks, we solve problems, and we do it by ourselves. We don't have conversations about it. In developing relationships, they are awfully important in helping kids to understand mathematics from different points of view. So they talk about friendship, but for me that math conversation, that's developing almost like a back and forth, where I can argue my point as it relates to a math problem, why I solved it this way and understand that different perspectives can still get me to the same answer. I just look at it a different way.

The other is kindness. One is being kind to yourself as a mathematician and realizing that you are not going to always get everything right. And it's okay. We can make mistakes, but we can make corrections. We learn from our mistakes. It is a different stance on making mistakes. It is also kindness from the teacher's perspective and from the student perspective. As teachers, we need to be aware of how we react to students' mistakes and how that makes students feel. Often times, in our response, be it our lack of understanding of the math, or be it just the time of day, or it's been a long day, our reaction can sometimes turn away kids. So exhibiting kindness in math.

The other one is confidence. For me as a math teacher, at every level confidence is a huge thing. Oftentimes kids understand the math, but because they don't have the confidence that they can do it or that they are doing it right, they don't trust themselves, and so you have a lot of second guessing. So how do we develop that confidence, where even if it is the wrong answer, you are confident in your answer? You can have a discussion about why you think your answer is right. You're still open to changing it, but that confidence exists.

Then the last two are courage and hope. Courage is the whole idea of being able to jump out and try even if I don't completely get it or completely understand it. Common core helps a lot. The standards of mathematical practice. The first one is perseverance, which is helping kids learn to persevere through problem-solving. That is courage: Being afraid that I might get it wrong, but it's okay and there is not like a doomsday for getting the wrong answer. Then hope, and hope is that I will one day be successful with this. I may not get it right now, but maybe in a few more tries, or if I look at it from a different point of view, or if I talk it over with a friend, I am going to be able to figure this out. As a teacher I heard too often: "I'm never going to get this; I just don't get this; I'm never going to get it." So they just shut down. So how do we develop that hope in students?

Chauntee Thrill: I want to talk a little bit about STEM, specifically for students of color. So how was building strong math academically connected to building rigorous STEM pathways for students of color?

Dr. Jennifer Banks: When we talk about the idea of belonging and realizing that we are good at math, or we do fit in a math classroom, or we can be successful as a person of color in the math classroom, I think that is really key. Kids, if they don't have that sense of belonging, they don't see themselves as a mathematician, I think they are more likely to go on to another field, and STEM not being one of them. My first life was as an engineer. There was nothing necessarily about engineering that was overly exciting for me other than I liked math and science. That was the only main reason for going into the field. So if we see ourselves as belonging in that realm, I think it encourages kids to pursue different fields and STEM fields in particular.

Chauntee Thrill: Is there any advice or a call for action you would issue for mathematics teachers wanting to support students of color that are interested in STEM?

Dr. Jennifer Banks: I think my first thing would be to consider how you can transform your math classroom. How do you transform your classroom from you being the sole expert in the room to being one where you facilitate learning and you pull students in to be a part of their own learning experience? How do you make math meaningful for them in their everyday life? I think the other thing would be how do I explain my own content knowledge as a math educator to help students extend their knowledge of math? I think as math teachers sometimes we understand the process of mathematics, how you get to an answer, but we may not always understand, or have the conceptual understanding of the math, or it's been such a long time since we have seen that conceptual understanding. And you are like: "Oh the kids don't need that." Well, how do we help push kids to that farthest limit, to help them develop that understanding? I think the other thing is to help students, provide students with resources, to experience math differently. Maybe it is an afterschool club. I know when I was teaching I was a sponsor for the National Society of Black Engineers, and they offer a variety of afterschool programs and activities that support kids in their math, in their science, and in their engineering and technology realms. It kind of sparks their interest, and it's not your traditional mode to do some math problems. It's racing a car or building a robot, things that may be of more interest to students rather than the traditional classroom view. I think the other thing is to really begin to critically reflect as a teacher, reflect on your own math narrative. How did you experience math as a child? How did I begin to develop a math love or math hate or whatever it is? I think it's important for us as educators to always be conscious that we bring biases; we bring privilege into the classroom. That awareness of it, we are consciously aware of those, and we catch ourselves as we are making those assumptions. We catch ourselves as we are making those low expectations and prevent ourselves from doing that to our students. I think a lot of it has to do with really critically reflecting, and even math content knowledge itself, maybe we might need to take a pre-calc class this summer to kind of review some things. Just to kind of help teachers be a better resource for their students.

Chauntee Thrill: Thank you for taking the time to speak with me this afternoon. I really appreciate your insight based on your experiences, and I am just happy that you had the opportunity to speak with us this afternoon.

Dr. Jennifer Banks: I appreciate you. Thank you so much for considering me. I enjoyed it.

For more information about responsive mathematics pedagogy, we recommend that you visit the Washtenaw and Livingston County's educational services and Washtenaw ISD websites. For more podcasts, links to today's recommended resources, or to share your comments and suggestions, visit occrl.illinois.edu/democracy or send them via Twitter @occrl. Tune in next month when Angel Velez from OCCRL talks with Dra. Aurora Chang, Assistant Professor at Loyola University Chicago, about undocumented students' identity and the power of documentation. Background music for this podcast is provided by DubLab. Thank you for listening and for your contributions to educational equity, justice, and excellence for all students.