Leveling the Playing Field in Math: Key Takeaways

Thank you to those who joined us for this event, which took place on Wednesday, May 20, 2020. Below, you can read the reporter wrap-up our journalists wrote for you.

It's common to hear students say that they're just not "math people." But the idea that math is an innate ability can limit kids' prospects and reinforce racial and gender stereotypes. In this summit our reporters and their guests explored ways to support all students in math classrooms in elementary, middle, and high schools.

The discussions included a look at the potential of math coaches to improve instruction and the benefits of students talking together about their math thinking processes.

Here are takeaways we've distilled from those discussions with you, the Education Week readers.

High-Performing ELLs and Students With Disabilites

▸ **Moderator: Corey Mitchell,** Staff Writer, Education Week

▸ How do teachers develop and deliver meaningful, challenging math lessons for English-learners and special education students? Part of the challenge lies in confronting the broad labels attached to these students. The labels often fail to focus on their strengths and particular needs.

▸ **Guests:**

• **Bradley Witzel**, Professor and Special Education Program Coordinator, Winthrop University College of Education

• **Cathery Yeh**, Assistant Professor, Attallah College of Educational Studies, Chapman University

Key Takeaways:

- During remote learning, work to ensure access for English-language learners and students with disabilities by using web-based extension tools that offer text-to-voice, voice-to-text, embedded dictionaries, and captions
- Maximize engagement as much as possible during remote lessons. Try to mirror the interactions and feedback students would get from in-person instruction. Focus on tasks that allow students to draw, write, and talk out their thinking and reasoning.
- Hands-on learning through play and inquiry are the best ways to learn mathematics: allowing students to see, touch, solve, and create helps them develop understanding.
- All teachers should support learning mathematics through language. Embrace math vocabulary for English-learners and students with language-based learning disabilities.

Resources:

- How to Teach Math to Students with Disabilities, English-Language Learners
- Chapman University Atallah College of Educational Studies Math Play Activity Series

Developing Your Student's Math Identity

▸ **Moderator: Sarah D. Sparks,** Assistant Editor, Education Week

▸ Guests from the Howard County School District in Maryland discussed math curriculum that's designed to help students examine and reshape their math identities and see themselves as a "math people."

▸ **Guests:**

• **Molly Schaefer,** 8th Grade Math Teacher, Murray Hill Middle School, Howard County Public Schools, Md.

• **Jon Wray,** Coordinator of Secondary Mathematics, Howard County Public Schools, Md.

Key Takeaways:

1. **Acknowledge and confront existing emotions.** Students don't start each school year with a blank slate--they bring all of the feelings and worries that they've developed about math through the years into the next year's class with them. Talking about where students' attitudes toward math come from can help them let go of negative associations and embrace past moments of success and confidence, Schaefer said.
2. **Model mistakes and growth. "**As much as I try to make my lessons perfect, I make mistakes and I own up to them in class, I don't try to hide it," Schaefer said. "Taking away the facade that everything has to be perfect all the time gives people a chance to breathe when they make a mistake. Letting kids see that the adult makes mistakes too gives them permission to make mistakes and learn from them."
3. **Show students how they already use math all the time.** We carry this idea that some students are "math people," and some aren't--a notion that can be damaging, said Wray. Schaefer and other teachers in the chat said showing students how math is relevant to their daily lives can help them feel more comfortable with the subject. "Walking into the classroom without bumping into the door, that's [spatial] reasoning. Getting dressed for the temperature outside, that's number sense," Schaefer said.

Resources:

[The Myth Fueling Math Anxiety]

[StoryStrong Mathematics website]

Math Talk: Tool for 'Productive Struggle'

► **Moderator:**

► **Catherine Gewertz**, Senior Contributing Writer, Education Week

‣ In this discussion, guests explored the push to get students doing the talking and reasoning in math class. What does that look like both in class and remotely? How can it contribute to a more inclusive classroom and greater equity in math learning?

► **Guests:**

• **Robert Q. Berry III**, Samuel Braley Gray Professor of Mathematics Education, School of Education and Human Development, University of Virginia, and Past President of the National Council of Teachers of Mathematics

• **Amanda Jansen**, Professor of Mathematics Education, University of Delaware, and author of *Rough Draft Math: Revising to Learn*

Key Takeaways:

- When you're trying to spark productive dialog about students' math thinking, it's helpful to have strategies to use. Participants suggested many, including: Notice and Wonder, Which One Doesn't Belong, Talk Moves, Splat!, My Favorite No, and Gallery Walks.
- Teaching students to think of their math process as a series of "rough drafts" is important to help them deepen their understanding of math ideas and practices, and to create an equitable learning environment.
- Creating silent space to let students to think is an important strategy to support math discussion. Sometimes that can be cut off when the quicker responders raise their hands. To extend the silence to accommodate all students, have students use a "thumbs up" sign or place their hand on their chest, when they have an idea. Then begin discussion again when you know everyone has had sufficient thinking time.

Resources:

Tools for math discussion while teaching remotely: online collaborative whiteboards, using the online collaborative space Padlet; using PearDeck to add interactive formative assessments to Google Slides; using Flipgrid to communicate with quick video conversations; using Seesaw to engage students with digital portfolios

- *The 5 Practices in Practice: Successfully Orchestrating Mathematical Discussion in your Middle School Classroom*
- *Rough Draft Math: Revising to Learn*
- Fraction Talks
- "Number talks" videos on the Teaching Channel
- *Talk Moves, A Teacher's Guide for Using Classroom Discussions in Math, Grades K-6*

Math Coaching

▸ **Moderator: Madeline Will,** Staff Writer, Education Week

▸ Just 18 percent of public schools had a math coach in the 2015-16 school year, according to federal data, and yet research suggests that math coaching is one of the most effective forms of teacher professional development available. In this discussion, Adrianne Burns, a middle school math coach and interventionist in De Pere, Wisc. and Aimee Ellington, a math professor at Virginia Commonwealth University, shared some insights to building an effective math coaching program.

▸ **Guests:**

- **Adrianne Burns**, Math Coach, De Pere Middle School, De Pere, Wis.
- **Aimee Ellington**, Professor, Virginia Commonwealth University

Key Takeaways

- **Start with a coaching vision statement.** When schools have a clear vision of what their math coaching goals are, it helps guide the coach's work and helps teachers understand the role of the coach, Burns said. This can also help avoid overextending coaches, so they can do their most effective work.
- **It takes time to generate buy-in among teachers.** Ellington's research shows that many teachers need some time to feel comfortable working with a coach and understand that they're not in an evaluative role. In the meantime, commenters suggested that coaches demonstrate their own vulnerability in order to encourage teachers to open up and remind teachers that even professional athletes need coaches to improve. Ellington said that one avenue into the classroom is for coaches to provide resources for lessons and to offer to model a lesson that a teacher might find particularly challenging.
- **Let teachers drive the coaching.** Burns encouraged coaches to let teachers identify what coaching goals they want to work on. Even if administrators have told teachers to work on a specific strategy, it's often more effective for coaches to weave that into what the teacher wants to work on, she said. This will help boost teacher engagement. Also, "coaches should guide teachers to their own solutions," she wrote. "My mantra this year has been, 'My solution is not their solution.' I want to create teacher agency, not teacher dependence on me."
- **Work to develop a "growth mindset" culture.** Working with teachers on math concepts in professional learning communities can help build confidence, commenters said. Burns said she keeps the focus on student learning while coaching so that it feels "less like a personal attack and more constructive." Ellington said she observed one highly effective coach who asked teachers she worked with if it was OK for other teachers to come into the classroom while she was modeling or co-teaching.
- **Relationships are key—especially if remote learning continues in the fall.** Burns recommended that coaches get to know the teachers they're working with in informal, one-on-one conversations. If school buildings are not completely reopened at the start of next school year, that might mean scheduling a regular call or video chat with teachers so coaches can check in how they're doing and what support they might need.

Resources

Books

- *Everything You Need for Mathematics Coaching: Tools, Plans, and a Process that Works for Any Instructional Leader* by Maggie B. McGatha et al.
- Making Sense of Mathematics for Teaching series, by Juli K. Dixon, Edward C. Nolan et al.
- Teaching Student-Centered Mathematics series, by John A. Van de Walle et al.

Online resources

- Teaching Practices & Shifts in Classroom Practice Look Fors https://resources.corwin.com/sites/default/files/appendix_bookmarks.pdf
- The Conscious Competence Learning Matrix: https://athleteassessments.com/conscious-competence-learning-matrix/
- Christina Tondevold's videos on teaching math https://www.therecoveringtraditionalist.com/
- YouCubed.org: https://www.youcubed.org/
- Twitter hashtags #MTBoS and #iteachmath

Research

Whitenack, J. W. & Ellington, A. J. (2020). Purposefully Coaching Middle School Teachers: The Case of an Exemplary Mathematics Specialist. NCSM Journal of Mathematics Education Leadership, 21 (1), 13 – 29.

Ellington, A. J., Whitenack, J. W. & Edwards, D. E. (2017). Effectively coaching middle school teachers: A case for teacher and student learning. Journal of Mathematical Behavior, 46, 177 – 195.

Special Report: Leveling the Playing Field in Math

- **Who's Afraid of Math? Turns Out, Lots of Students**
- **How One District Is Raising Math Rigor and Achievement for Students of Color**
- **Anxiety Can Make Kids Avoid Math. Here's How They Can Talk Through the Fear**
- **Math Teachers Take a Page From English/Language Arts: Comic Books!**

For more information about the "Leveling the Playing Field in Math" special report, read the entire report here.

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