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The Missing Middle? General and Special Educators' Views of Effective Mathematics Instruction | Q&A with the Authors

The authors of the recently published article, *The Missing Middle? General and Special Educators' Views of Effective Mathematics Instruction*,* sat down with CADRE to answer questions about their research and what led them to examine mathematics instruction through the lens of both general and special education. In this Q&A, researchers Julie Cohen and Nathan Jones reflect on their interdisciplinary inquiry, exploring how researchers from these two fields approach the persistent divide in supporting students with disabilities. Motivated by their experiences as educators, parents, and scholars, they share what surprised them most, what helped bridge perspectives, and what changes they hope to see in the future.

What first drew you to investigate the "math wars" through the lens of general vs. special education researchers?

Well, we were not necessarily drawn to studying the math wars, but we were really committed to understanding why so many general education teachers receive so little training to support students with disabilities. Neither of us are mathematics educators, but we have seen this pattern emerge across general education and special education across subject areas, and the need is especially pronounced in mathematics.

Julie—My interest in this topic began as 5th-7th grade mathematics teacher who worked with many students with disabilities. My only teacher preparation course that even discussed students with disabilities was a survey course on "exceptional learners" that profiled different types of exceptionalities each week. None of my methods courses discussed explicit instruction, managing students' cognitive load, or any of the evidence-based practices we know supports students with disabilities. Now as a teacher educator and researcher, I have seen the same patterns in research on mathematics teaching, as well as in mathematics methods courses more broadly.

I also come to this topic as a parent of a child who has challenges around working memory, attention, and processing. These are incredibly common issues, and yet so few general education teachers know how to provide the kinds of evidence-based scaffolds that help her engage with rigorous academic work. My daughter never loved mathematics, but in seventh grade she had a teacher who was trained as a special educator and utilized a lot of explicit instruction. This was a real turning point for her in learning to feel more confident and excited about mathematics.

Nate—I come to this work as a former middle school special educator, where I spent a lot of my time outside of my teaching day supporting my students and supporting the general education teachers who taught them. For my teacher colleagues, they were often frustrated they couldn't better support their students who were struggling with mathematics. Not only that, but they also expressed concerns about the lack of time and resources to differentiate their instruction to meet the range of learners in their classrooms.

More recently, as a researcher, I spent the last several years examining the ways in which the observation tools used in teacher evaluation reflect the work of special educators. Here, I found that

classroom observation tools fail to capture the kinds of instructional practices that special educators are most commonly taught to use. To me, this gap between general education and special education is present most everywhere we look in teacher preparation and development.

Which points of convergence between general and special educators surprised you most?

We were struck by how consistently scholars across fields prioritized conceptual understanding. Special education researchers get a bad rap for being overly focused on procedures and rote memorization. Not a single special educator we interviewed described "good math teaching" that way. Unprompted, nearly all of the researchers we interviewed led their answers with a focus on conceptual understanding. This shared commitment to scaffolding students' understanding of mathematical ideas provides a clear point of connection. We also want to note how openly general educators acknowledged the importance of doing more to center students with disabilities in mathematics teaching. Both groups recognized that there was much more to be done to focus squarely on this student population.

If there were any interviewees who bridged the typical divides you identified, what factors contributed to their understanding of and approaches to mathematics instruction?

The general educators who identified as cognitive psychologists or learning scientists tended to be the ones who were most knowledgeable about and open to special education methods. This makes sense given that many explicit teaching practices focus on managing students' cognitive load. There were also a couple of special educators we interviewed who had either personal relationships or prior collaborations with general educators. These folks also expressed a deeper understanding of the approaches advocated for by the other discourse community.

You highlight "managed discussion spaces" and "insider-outsider emissaries." Can you share an example of what a successful bridge-building event might look like?

In the context of our study, we followed this interview work with almost two years of consensus-building panels with both general and special educators. The two of us played the part of "insider-outsider emissaries" as neither of us are firmly in the field of mathematics education, though we both read a lot in mathematics education and have done research on mathematics teaching. As a result, we could facilitate these discussions with some ideas about what we needed to push on—for example, what did people mean exactly when they said "explicit instruction?"—but we could also take more of an inquisitive stance because we did not have "skin in the game" so to speak. It was probably also helpful that both of us conduct interdisciplinary research and use both qualitative and quantitative methods in our scholarship. As a result, we were pretty comfortable talking with folks with different epistemological traditions and orientations towards research.

There were a few other important factors that we think made our "managed discussion spaces" productive. First, we established ground rules from the outset around assuming positive intent for all panelists. Our discussions got heated, but they were also always respectful. We tried to orient our conversations around shared artifacts—videos of teaching, examples of student work—to try and concretize the ideas, rather than talk about views in the abstract. Second, these efforts took time. We met with our consensus panel three times across two years. And our panelists openly acknowledged that the time spent collaboratively is what facilitated trust and the ability to truly hear one another.

Finally, and most importantly, all our panelists came to the work with a commitment to learning. This seems obvious but many academic conversations go off the rails because folks are oriented around sharing their own views, rather than really trying to understand others' views. Our panelists authentic openness was critical.

Based on your findings, what one change would you most urgently recommend for mathematics methods courses?

The general education mathematics researchers we interviewed were largely unaware of the key principles undergirding special education scholarship around supports for students with disabilities. This makes it challenging to simply add readings or assignments to math methods courses. Instead, we would encourage math educators to reach out to their special education colleagues for support. Even if formal co-teaching of courses is impossible, guest lectures from those with the relevant expertise could go a long way to providing pre-service teachers with insight into how to scaffold their instruction for students with disabilities.

What advice would you give to early-career STEM education researchers hoping to work across disciplinary "bunkers"?

The most important thing is to read widely, including in journals outside of your particular field. We have been struck by how little insight these communities had into the research findings of the other community. It is much easier to mischaracterize the beliefs and findings of another discourse community when you do not really engage with their ideas. The other piece of advice would be to have a cup of coffee or a meal with someone working in a different field. At many schools of education, special education is its own department. This creates a structural silo that makes de-bunkering harder. It will take concerted effort for early-career STEM education researchers to engage with those working in distinct spaces. We would argue though that these informal opportunities to talk about work with people who think about teaching in distinct ways is vital for sharpening and refining our own perspectives.

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