

PREPARING ALL NEW TEACHERS TO PROVIDE INCLUSIVE INSTRUCTION

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Collaborative Research: Leveraging Simulations in Preservice
Preparation to Improve Mathematics Teaching for Students with
Disabilities



Boston University Wheelock College of Education
& Human Development



SCHOOL of EDUCATION
and HUMAN DEVELOPMENT

OUR GOALS FOR THESE SESSIONS

- We want to engage you in discussions of the challenges faced in preparing general educators for inclusive practice
- We want to share our efforts to build curricular materials that we hope will improve general educators' preparation for inclusive practice
- We want to generate, collectively, strategies for improving general educators' preparation for inclusive practice

AGENDA

Introductions

The Challenge and the Opportunity

Goals of our NSF Study

Themes from Interviews

Video Analysis: Ms. Marchant

Closing and Looking Ahead

WHO ARE WE?

- Teacher educators
 - General education
 - Special education
- Researchers
 - Teaching quality
 - Measuring teaching
 - Supporting pre- and in- service teachers



THE CHALLENGE AND
OPPORTUNITY

THE CHALLENGE

- Preservice teachers in general education typically enter the field with limited preparation to work with students with disabilities
- Only seven states require coursework for working with students with disabilities, and only two require clinical experiences working with these students
- Despite this lack of training, nearly all teachers will work directly with SWDs
 - 14% of the K-12 student population
 - Most commonly supported by general educators

BUT PERHAPS A BROADER CHALLENGE...

- Fields like special education and math education do not see eye-to-eye on what “good teaching” looks like
- Candidates are given different messages about:
 - The goals of math learning
 - The role of the teacher
 - The role of students
 - The value of fluency
- Candidates are left to themselves to navigate competing messages

WHAT WE ARE TRYING TO DO

- In our research, our focus is on improving mathematics instruction for students with disabilities in general education.
- This instruction is not meant to replace the kinds of intensive intervention that many students with disabilities need.
- We want to improve training of general educators in two ways:
 1. We want them to develop a broader repertoire of instructional strategies.
 2. We want them to understand why these strategies are essential for some learners.

WHAT WE ARE NOT TRYING TO DO

- We are not trying to meet all of a student's needs in general education.
- We are not pitting general and special educators or methods against each other.
- We are not asking general and special educators to resolve all of their epistemological differences, if there are any.

STOP AND JOT

- What makes it hard to prepare general educators to provide inclusive instruction?
- Post responses in chat!

OUR PROJECT

- Build consensus between general and special education mathematics educators
- Build curricular materials for general education mathematics methods courses focused on special education “high leverage practices”
 - Schema-based strategy instruction
 - Cognitive modeling
 - Grossman and colleagues (2009) pedagogies of practice- representations, decompositions, and approximations/simulations
- Test the effectiveness of our modules
 - Limited causal evidence base in teacher preparation



SIMULATING PRACTICE

A NECESSARY FIRST STEP: CONSENSUS BUILDING

- What are the goals and characteristics of mathematics instruction that is supportive and inclusive of SWDs?
- Given common challenges for students with disabilities in math, how will these students likely struggle with certain types of mathematics instruction?
- What instructional supports enhance accessibility and why?

GROUNDING ASSUMPTIONS

- Classroom-based interactions are both situated in and reflective of broader historical and cultural narratives about what schooling is and who gets to participate in learning activities, especially in mathematics.
- Special education, in particular, has a particular history in which conceptions of intelligence and ability have often been connected to views about Black and Latinx students. Today there is still a disproportionately high number of Black and Latinx students in special education, and a disproportionately low number in gifted education settings.
- We cannot and should not divorce conversations about special education, particularly how it is often enacted in schools, from conversations about race and racism. They are inextricably intertwined. Students with disabilities have intersectional identities that must be acknowledged and honored by the teachers with whom they work.

INTERVIEWS

- 25 semi-structured interviews (October – December 2020)
 - National experts in mathematics education and special education who have done considerable work in these areas
 - Prioritized including diverse voices—scholars squarely focused on equity in mathematics teaching and learning
 - Nearly 100% participation from folks we invited

INTERVIEWS

- Interviews surfaced both challenges and points of intersection.
- We left the interviews wanting to hear conversations across these perspectives.
- We see this meeting as an opportunity for those conversations and to move beyond disagreements and to find space for agreement.

THEMES FROM INTERVIEWS

WHAT GOALS WERE FOREGROUNDED?

- Proximal: Developing mathematical knowledge, completing a task successfully, performing on an assessment
- Distal: Developing an identity as a mathematical sense-maker, someone who uses math to engage with the world
- A few special educators said that the goals of math were to cover the math curriculum
- Some, but not nearly all, of the special educators foregrounded proximal goals
 - In conjunction with a prioritization of cultivating productive mathematical identities
- Nearly all general educators foregrounded the distal goals

DIRECT QUOTES: WHAT GOALS WERE FOREGROUNDED?

- “The goal to me is to create a classroom environment where students have the opportunity to, and are regularly positioned as, mathematical thinkers.”
- “At the elementary level, in particular, the goal of mathematics is to help students develop flexibility, and some general level of understanding of number and its purpose and how it's used as a tool for representing things.”
- “Teachers should be giving kids activities that ask them to think and see mathematical ideas in different ways and talk about the different ways they see them.”

COMMONALITY AROUND KNOWING ONE'S STUDENTS

- The key to effective instruction is deep understanding of students.
- Researchers across groups highlighted that teachers assess students-- with formal assessments, but also in many informal ways—and use insights to inform instructional supports.
- Special educators stress that the most important role of a teacher is to design **instructional activities that are appropriate for individual students**. Thus, when they think about teacher education, one of the key goals is to have sufficient expertise of math and of students to design instruction for various student populations.

DIRECT QUOTES: COMMONALITY AROUND KNOWING ONE'S STUDENTS

- “So really, it has to start with an understanding of who the students are. What does it mean to really help them succeed from an asset perspective as people who are able to do this, in this situation, with these supports, with this, etc.?”
- “It is not an easy thing to do to understand how to reach, like, 30 kids in a class and make sure it's accessible for everyone. But I think that a first step is saying that you want to get to know your students mathematical understanding, particularly students with disabilities.”

LABELS, INDIVIDUALIZATION, & ENGAGEMENT

The Role of Individualization

- GENED: Instruction should not be different for students with disabilities. Make scaffolds and supports available to all students to reduce stigma for SWDs.
- SPED: Instruction should reflect the distinct instructional needs of SWDs, but, we have proven methods that could work for all struggling students.
- Sidenote: Many general educators were not comfortable with labels related to disability

Engagement and what fosters it?

- GENED: Engagement is fostered through student-centered work.
- SPED: Engagement is fostered through students' ability to engage with mathematical tasks, feel successful as participating in classroom work.

DIRECT QUOTES: LABELS, INDIVIDUALIZATION, & ENGAGEMENT

- “Students should be actively engaged in the math, in the math learning process. I think that that's probably pretty tightly tied to their sense of self-efficacy. And the way in which they've been engaged in the math learning community.”
- “If teachers just keep doing what we're doing, and its results in students not achieving very well, we have to acknowledge the fact that what we're doing isn't right. It's either not right for the kids with disabilities, or it's just, it's discriminatory.”
- “We don't talk about categories of kids, we're going to talk about good teaching, we do talk about language learners, because that seems different. It's not on the same kind of spectrum. I think what kids really need who have special learning differences,...I think the things that kids have, as learning differences, are also experienced by everybody to varying degrees.”

TIME & GOALS

- Shared consensus surrounding the importance of coverage of critical content...at the expense of wide coverage of the curriculum.
- Special ed researchers focus on the “tyranny of time” and “placing bets” on what approaches maximize likelihood of positive outcomes for SWDs.
- What role does efficiency play in mathematics teaching and learning?

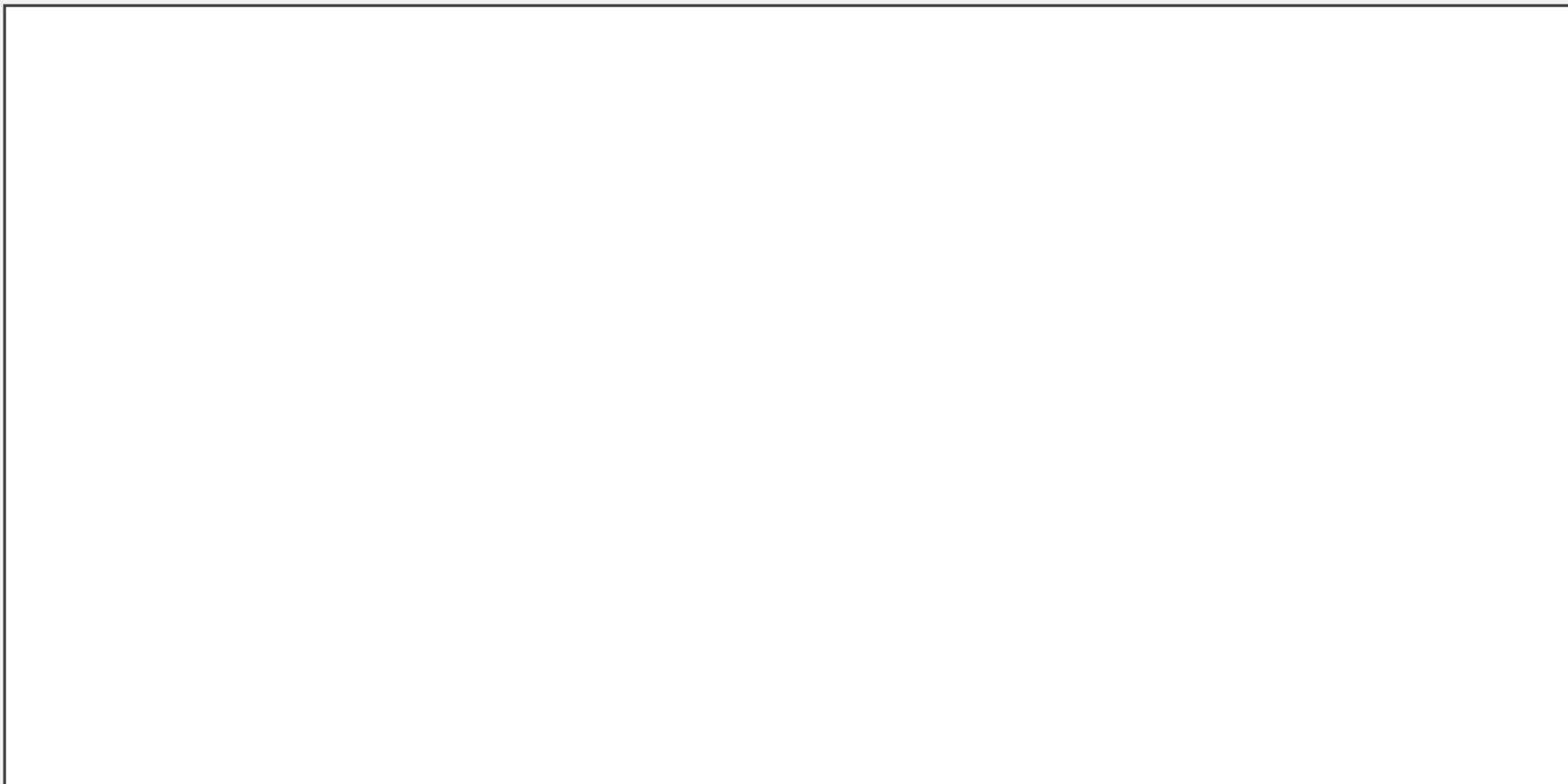
DIRECT QUOTES: TIME & GOALS

- “I do think some children who we would categorize as having special needs and benefiting from explicit instruction, I think part of it is the tyranny of time, right. You just don't have enough time. Could they inductively understand? Perhaps, with enough examples, and enough time and enough, but you know, we've got 48 things to learn, and there's no time to do that. So the choice is, do we do less and make it more meaningful.? This is the old adage, right? Or do we try to keep pace, which is the NCLB thing.”
- “I mean, in any learning, it's not enough just to have experienced it once in a whole group discussion. Even if that whole group discussion was rich. You need that self-reflection and application time to process ideas. And that processing is what independent time and practice provides.”
- “Time is fixed. It's all a casino. So where do you place your bets?”

VIDEO ANALYSIS: MS. MARCHANT

AS WE WATCH MS. MARCHANT....

- What might be some of Ms. Marchant's goals?
- What challenges might SWDs face in engaging with/working towards those goals?
- What strategies might Ms. Marchant use to support engagement for those students?
- How do those strategies support/undermine the array of goals we may have for SWDs in mathematics classrooms?
- Video Link (5:19-9:20): <https://youtu.be/3bRB8OKvRJ8?t=318>



BREAKOUT GROUPS

BREAKOUT GROUP

Instructions: Nominate a facilitator(s) to capture key elements of their group's discussion.

- What might be some of this teacher's goals?
- What challenges might SWDs face in engaging with/working towards those goals?
- What strategies might this teacher use to support engagement for those students?
- How could teacher education programs help prepare teachers to employ such strategies?

WHOLE GROUP CHECK-IN

MS. MARCHANT

- What might be some of Ms. Marchant's goals?
- What challenges might SWDs face in engaging with/working towards those goals?
 - What strategies might Ms. Marchant use to support engagement for those students?
 - How do those strategies support/undermine the array of goals we may have for SWDs in mathematics classrooms?

CLOSING

LOOKING AHEAD TO FRIDAY

Tomorrow we will focus on the challenges and opportunities for preparing teacher for inclusive education in your local contexts

Take ~5 minutes to respond in google form

<https://docs.google.com/spreadsheets/d/1CYd3Ydx0aA4vyQ0MZF7AkaZsl7sMkyLw9VLI4ORIMcE/edit?usp=sharing>

- Takeaways from today?
- What approaches to inclusive practice are you already taking?
- What would you want to know more about?

DAY 2- FRIDAY

REFLECTIONS ON DAY I

CHALLENGES AND OPPORTUNITIES FOR THIS WORK IN YOUR LOCAL CONTEXTS

- What approaches are you already taking?
 - General education methods coursework
 - Field placements
 - Other program components
- What challenges have you faced in your own programs in promoting inclusive practices in general education?
- What would you want to know more about?

TODAY'S PROCESS

- Work in groups of 8-10
- Share strategies and approaches
- To share with the full group:
 - Identify 1 large-scale strategy that would take concerted effort
 - E.g., change licensure requirements at the state level
 - Identify 3-5 smaller scale strategies that could happen sooner
 - E.g., Incorporate special education readings into methods course

GENERATING STRATEGIES

- Drawing on what group members are already doing or ideas that get generated during the group discussion...
 - Identify 3-5 strategies you could implement immediately
 - Identify 1 long-term strategy that would take time...and possibly resources...but would likely be impactful
 - Create a slide per group summarizing your strategies
 - <https://docs.google.com/presentation/d/1DWxoUGZB9IzIZ6wePiC4Fk0chONt4VnjNUkEEtLAAsg/edit?usp=sharing>

SHARE OUT

Please take 5 minutes to review the slides

- We will also make these available after meetings!

Share out any surprises or lingering questions:

<https://docs.google.com/spreadsheets/d/1CYd3Ydx0aA4vyQ0MZF7AkaZsI7sMkyLw9VLI4ORIMcE/edit?usp=sharing>

THANK YOU!

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