Leadership Considerations in Mathematics for Students with Disabilities

A Position Statement from NCSM

Our Position

NCSM's vision of mathematical learning is that all students engage in equitable, meaningful and high-quality mathematical experiences that lead to powerful, flexible uses of mathematical understanding to affect their lives and to improve the world. We assert the same goal for students with disabilities. This commitment is non-negotiable, yet the current landscape of mathematics education for students with disabilities reveals a stark and often egregious disparity that demands immediate and systemic redress. Education leaders, at all levels, have a shared responsibility to address this vision and the resulting inequities but too often general education and special education teams function as two separate entities. This fragmented approach limits opportunities for collaboration and creates barriers to equitable learning experiences for students. A shift toward more unified systems is needed, wherein all leaders, general and special education educators, instructional leaders, counselors and interventionists, and principals are empowered to work together to provide inclusive practices that uphold high expectations for every student. For mathematics leaders, this also means navigating the complexities of research, policies, and practices to make informed decisions. Without a shared vision, interdisciplinary collaboration, and a commitment to inclusive pedagogies, educators risk excluding students from meaningful engagement with grade-level mathematics content. Addressing these challenges requires systemic changes in how learning experiences are developed and delivered for students, in the ways teams of professionals collaborate in outcome-focused communities of practice, the nature and frequency of ongoing learning opportunities for educators, and in the quality of partnerships within and beyond the school walls. In doing so, mathematics leaders can ensure students' mathematical education is equitable, research-informed, and accessible. NCSM Leadership in Mathematics Education issues a clarion call for all mathematics leaders to create and maintain systems that empower decision-making at all levels, prioritize ongoing and job-embedded professional learning that centers on research-based and inclusive mathematics instruction, and to dismantle barriers to access and participation in order to ensure every learner is supported and thrives in mathematics.

The Mathematics Special Education Landscape

In recent years, the number of students who received special education and/or related services under the Individuals with Disabilities Education Act was 7.5 million, or the equivalent of 15 percent of all public school students (National Center for Education Statistics, 2024). Disability is an extremely diverse category, including sensory disabilities, chronic illness, mental health, as well as neurodiversities including autism, ADHD, learning disabilities such as dyslexia and dyscalculia, intellectual disabilities and more. Students with disabilities may qualify in multiple categories of disability. Students with disabilities may also be multilingual learners. Intersectionality matters in the experiences of these students, as for example Black and Latino students with disabilities, particularly emotional or behavioral disabilities, are more likely to be placed in separate special education classrooms than their white peers with the same disability (Waitoller et al., 2010). Paradoxically, individuals with disabilities are often treated as one cohesive group but they are more different than they are alike. The only common factor is that they are all outliers, but for many different reasons.

Likewise, mathematics leaders would do well to consider the students' perspectives on these complex issues. Their voices, experiences, and strategies of resistance must be central to our analysis and decision-making processes to truly disrupt inequities. It compels us to respond to students' inherent strengths and resilience by systematically including their histories, experiences, and diverse ways of knowing and engaging in mathematics (Yeh, 2023).

For decades, mathematics has served as a gatekeeper for higher learning, future careers, and personal and professional attainment (Aguirre et al., 2024; Burdman, 2018). As Kirkpatrick and colleagues write,"historically, school mathematics policy in the United States was based on the assumption that only a select group of learners should be expected to become proficient in mathematics" (Kilpatrick et al., 2001, p. 21). These policies led to a system that functioned as a formidable barrier, severely limiting access to higher learning, future careers, and personal attainment for countless individuals. Disturbingly, this gatekeeping continues to be particularly pervasive for students with disabilities. Students with disabilities underperform on standardized measures of mathematics achievement compared to non-disabled peers, and the gaps widen over time (Wei et al., 2013). Despite similar achievement, teachers are less likely to place students with IEPs in higher-level algebra classes in 8th grade, even when their grades were the same as other students (Faulkner et al., 2013). Students with disabilities in separate settings have had less access to mathematics instruction that focuses on concepts (Jackson & Neel, 2006) and less access to standards-based mathematics (Kurz et al., 2014). Scholars have noted that because disability has been framed as a deficit, myths have developed that students with disabilities are not capable of creative mathematical thought, myths that

significantly impact student access to higher-level mathematics (Lambert, 2018).

In fact, students with disabilities can think creatively mathematically, just like any other person. Dyslexic adults are mathematicians at the highest levels (Lambert & Harriss, 2022), dyscalculic adults can major in mathematics at the undergraduate level (Lewis & Lynn, 2018) and adults with autism are more likely than other groups to major in STEM fields (Wei et al., 2017). The struggle for educational equity for disabled students is not merely an academic concern; it is a fundamental civil rights issue, echoing the powerful movements of the past in which activists with disabilities fought for laws such as the Americans with Disabilities Act. A consistent demand has been access, participation and belonging in schools. Beginning in the autistic community, the neurodiversity movement has advocated for an understanding of autism as both strength and challenge, a natural part of human variability. These movements teach us to approach the issue of disability with a strengths-based perspective, rather than an assumption of deficit.

Mathematics is critically important for all in the United States. The outcomes of learning mathematics extend far beyond the acquisition of content knowledge. As an example, being mathematically literate allows one to meaningfully participate in civic engagement and other democratic processes within their communities, critically analyze a wide range of problems that are of personal and societal interest, and make personal financial decisions that allow for greater social mobility (Nagasaki, 2015).

It must be recognized that disabled students of the global majority (Love, 2010) are impacted by intersectionality, or overlapping and interconnected forms of social marginalization (Crenshaw, 1989). Students are the most aware of how these interlocking oppressions function. Again, centering students' voices, lived experiences, and strategies of resistance is essential for disrupting inequities.

The Mathematics Special Education Landscape

High-quality instruction is a human right that all students are entitled to. High-quality mathematics instruction should be informed by multiple research perspectives and inclusive practices (King-Sears et al., 2023). Classrooms and the students in these classrooms, should not be considered as separate or belonging to a different system. Schools must foster an asset-based mindset, ensuring students with disabilities are recognized as capable learners and given access to grade-level content. We are meant to serve every student, regardless of disability, as someone with a right to high-quality instruction and high expectations (i.e. grade-level content).

All students can learn mathematics and should be provided the necessary tools to succeed at high levels and with grade-level content. By promoting inclusive pedagogies, pedagogies that keep students with disabilities with their peers to the greatest extent possible, it becomes more and more apparent that disabilities are not an obstacle to success in mathematics. Rather, they become opportunities to provide tailored support that allow for nuanced perspectives

and approaches to be seen, understood, and leveraged so all students in the classroom can grow in their understanding (Schnepel et al., 2022). In fact, individuals with diverse backgrounds, experiences, and neurologies bring unique perspectives to the field of mathematics, which only further advances the field (Austin & Pisano, 2017). So yes, students with disabilities need mathematics for a myriad of reasons, but the field of mathematics needs students with disabilities, too (Tan & Kastberg, 2017).

Inclusion is essential, not only in physical placements but in ensuring that students with disabilities actively participate in grade-level mathematics content. Special education is a service, not a place. This means students are learning mathematics with their non-disabled peers to the greatest extent possible (Individuals with Disabilities Education Act, 2004). Creating these inclusive environments to provide accessible and engaging mathematical learning requires real collaboration between educators. Likewise, co-teaching models can be promoted, where general education and special education teachers collaborate to provide high-quality, inclusive math instruction, including the use of UDL principles to meet diverse learners' needs in the math classroom.

Reimagining Mathematics Education: From Gatekeeper to Gateway

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Collaboration and Shared Responsibility

Collaboration amongst educators, families, and community partners allows for various kinds of expertise and perspectives about students to be understood in order to support students' learning and well-being (McLeskey et al., 2017). Leveraging diverse expertise involves working together to engage in shared reflection, refine educational practices, and build math learning environments where every student thrives. It requires that all constituents be curious, open-minded, and value the contributions and expertise of each other. Asking questions and considering perspectives that may be different from our own helps us to understand the actions of others. For example, combining knowledge of curriculum, instruction and understanding of a student's individualized strengths and needs, creates classrooms where students with disabilities access grade-level content while receiving necessary support. For example, we encourage general education and special education mathematics teachers to collaborate with families to develop meaningful mathematics IEP goals for students that prioritize access to grade-level mathematics.

Systemic Support and Transparency

Currently, and because special education operates, at least in part, as a separate system, there are issues integrating systemic structures for both students in special education and those in general education. We recommend purposeful work integrating systems towards the goal of all students, including students in special education, having access to rigorous, grade-level instruction within an inclusive framework. And since every educator is part of a system, from educational assistants to classroom mathematics teachers to the superintendent of a district, they can take action towards improving inclusive mathematics. A high-functioning systemic approach intentionally brings multiple constituents together and as a result, these systems leverage the expertise to create outcomes unattainable by individuals or single buildings alone (Cobb et al., 2020). No individual can be expected to possess all the knowledge needed to improve these systems, but by ensuring that every participant has access to the necessary expertise, the system can amplify the collective impact of their work.

Systemic approaches work toward long-term, coherent solutions. They are comprehensive and acknowledge interconnectedness within the system, including people, processes, and products that all influence mathematical outcomes. Table 1 outlines systemic structures that these collective groups should attend to and utilize and then highlights the purpose or benefit associated with that practice. When reading this, consider which are currently in place within your context and which could

Table 1. Systematic structures to support all students

STRUCTURE	PURPOSE/BENEFIT
Inclusive Leadership	Drives vision, resources, and accountability
Systemic Frameworks	Establishes consistent and predictive processes that affect all students (e.g. instruction, behavior, climate)
Data Systems	Informs decisions and monitors progress
Professional Learning	Equips staff with evidence-based strategies/ content knowledge
Collaborative Team Structures	Coordinates supports and leverages expertise
Family Engagement	Incorporates family insights and cultural context
Staffing & Retention	Ensures a qualified, stable workforce
Accountability & Oversight	Sustains effective, compliant practices

be improved or implemented to better support all students.

While districts and schools may be at different points in implementing all of these structures, increasing the number and depth of them strengthens the learning environment not only for students but also for staff. This work is a journey, and continued progress toward fully integrating these structures is essential. Importantly, as schools align leadership practices, data systems and processes, professional learning opportunities, and collaboration, the development of IEP goals should reflect this shift. In doing so, schools emphasize the importance of access to rigorous, grade-level instruction within an inclusive framework that benefits all learners.

Understanding Research

The teaching of mathematics should be based on high-quality educational research in combination with the goals that matter to constituents. Making recommendations about research can be complex because multiple academic fields do research on mathematics teaching and learning, sometimes with different underlying assumptions about what is most valuable in mathematics. These differences are particularly pronounced across mathematics education and special education contexts. Likewise, these differences may complicate the inclusion of students with disabilities in standards-based mathematics, as special educators and mathematics educators are asked to collaborate, despite being prepared within different research and pedagogical traditions (Cohen et al., 2025). In this statement, we take the position that interdisciplinary research can and should inform our practice, and that mathematics education leaders should become familiar

with multiple fields of research in order to make sense of sometimes contradictory statements. Relying on any one source or organization for the research can further create or perpetuate misunderstandings. As such, what follows is a summary of key research findings when considering how best to support students with disabilities and/or neurodiverse students.

Decades of research across the learning sciences, neuroscience, cognitive science and psychology do provide common understandings and insight into how to shape learning experiences and programs for students with disabilities. As examples, the Science of Learning and Development (Canter et al., 2018; Oster et al., 2018) and Darling-Hammond and colleagues (2020) call for teaching approaches that connect students' prior knowledge and their lived experiences, deepen both conceptual and procedural knowledge, and develop metacognitive skills in order to think in more complex and creative ways. In a world in which knowledge is expanding and jobs are shifting, educational settings should prioritize critical thinking and problem-solving skills while developing students' mathematical capacity and skills.

Effective mathematical learning experiences are complex and multifaceted by nature and require expertise at many levels to support students' mathematical development. This means engaging students in meaningful, challenging tasks that promote deep conceptual understanding and the transfer of skills (Darling-Hammond et al., 2020) and using inquiry-based approaches as a central instructional strategy (Alfieri et al., 2011; Bruder & Prescott 2013; Lazonder & Harmsen, 2016; Öztürk et al., 2022). Explicit Instruction seems most effective when learning set mathematical procedures (de Jong et al., 2023), but when intentionally balanced with guided inquiry it can be effective in supporting learning goals that are about conceptual understanding. Just as in the report by Darling-Hammond and colleagues (2020), scholars have called for a mathematics curriculum that includes problem solving and inquiry, as well as well-designed opportunities for more explicit instruction when necessary. Balance is key and those who claim only direct instruction works may not be aware of the broader research findings (National Council of Teachers of Mathematics & Council for Exceptional Children, 2024).

When guided inquiry is paired with other structures, such as collaborative learning, students are encouraged to question, explain, expand on their thinking, and work together to develop solutions. Likewise, when teachers and teacher leaders use continuous and timely diagnostic assessments, wherein constructive feedback creates opportunities for students to reflect on and revise their learning, they are able to demonstrate competence. Furthermore, when learning experiences of this nature are used on a regular basis, students strengthen their metacognitive abilities by planning and managing complex tasks, engaging in self- and peer-assessment, and reflecting on their learning processes. All of which are key components in a strong mathematics program that support students' mathematical thinking and reasoning as well as conceptual and procedural understandings.

Research on the mathematical learning of students with disabilities has historically been published in special education and psychology journals, with little focus on disability in mathematics educational journals (Lambert & Tan, 2020). The majority of research on students with disabilities has historically been focused on direct and explicit instruction, leading to a body of evidence that these forms of instruction are effective at teaching discrete mathematical skills to students with or who are yet to be identified with disabilities (Chodura et al., 2015; Gersten et al., 2009; Stevens et al., 2018). The second issue is that the field of mathematics education has, for the most part, excluded students with disabilities from its research. Little research in mathematics education in the past has either focused on, or even included, students with disabilities (Lambert & Tan, 2020). These two factors, the dominance of research on explicit instruction for students with disabilities and the lack of research on students with disabilities in mathematics education, create the conditions for widespread myths that students with disabilities cannot benefit from inquiry-based practices in mathematics and should only be taught with explicit pedagogies. This is a dangerous assumption when it leads to the exclusion of a group of students from the pedagogies that are considered most valuable to reach current learning goals in mathematics. In a meta-analysis of instructional components, Gersten and colleagues (2009) found that both explicit instruction and strategy instruction, typically instruction in which various strategies are presented and students have choice in what they use, were effective for students with learning disabilities. They further stated "there is no evidence supporting explicit instruction as the only mode of instruction for these students" (p. 1229). Again, the research is clear; a balanced approach is needed.

As with general education students, students with disabilities are highly diverse in their needs in mathematics, with some students needing additional support and others excelling in the subject. As early as the Adding It Up report, (Kilpatrick et al., 2001), it was noted that students with disabilities do not learn mathematics in fundamentally different ways than those without disabilities and benefit from similar instructional principles; "existing evidence and experience suggest that the same teaching and learning principles apply to all children, including [students with disabilities]" (p.342).

Recognizing that students with disabilities can be highly successful in mathematics means recognizing their creative strengths. Often, students with disabilities and/or neurodiverse students create strategies of their own in mathematics such as in using the adding-on strategy to subtract without being taught (Peters et al., 2014). At the same time, neurodiverse students may have different pathways through developmental progressions. Skills that are considered more basic may be more challenging while more developmentally complex skills may come easier (Dowker, 2013), which suggests an individualized approach to intervention as well as making sure that students with disabilities are not "stuck" focusing on lower-level mathematics goals when they

are capable of more abstract mathematics.

With that said, in both special education and general education mathematics settings, studies show students learned most when teachers received focused professional development, when students were supported to engage deeply with their small groups, and when special education co-teachers are actively engaged in teaching (Bottge et al., 2002; 2007; 2014). Further research of this kind is necessary to equip mathematics leaders with the knowledge and strategies to effectively support students with disabilities in standards-based classrooms.

Professional Learning for Effective Instruction

First, on-going and job embedded professional learning is important for teachers and teacher leaders at all stages of their career. Teaching is a profession that cannot fully be mastered, and as findings from research continue to inform what we know about supporting all students, a priority on developing individuals and teams is important. We call for job-embedded professional learning that centers on research-based and inclusive mathematics instruction. Often, this may mean leveraging the expertise in the building. Mathematics leaders need to work alongside teachers to find, interpret, and implement recommendations for practice. This means mathematics leaders should also co-create opportunities for interdisciplinary professional learning between general and special educators so that both fields can contribute their unique expertise to addressing problems of practice. The importance of this on-going work cannot be overstated.

Furthermore, those designing the professional learning would benefit from considering research specifically in professional development and across multiple bodies of knowledge. Each body of research comprises different philosophies and views about what constitutes "high-quality" mathematics education; no single body of research should be considered the sole source. Having this understanding will allow mathematics leaders and teachers to navigate recommendations from federal entities, professional organizations, and researchers alike.

Next, mathematics leaders should help foster a healthy skepticism with teachers. They should encourage practitioners to surface bias in themselves, the systems in which we live and work, and in the research. Consider establishing a questioning routine, with questions like: "What assumptions am I making?" "What larger system is at work here?" "When and where was this study conducted?" "What role did local practitioners play in this research study?" "What did researchers not address in this study?" In doing so, those within the system learn to critically consider the decisions they make and the actions that follow.

Additional Resources

No one position paper, research article, or resource is sufficient to properly support teachers and teacher leaders as they move forward in supporting all students in learning mathematics. As such, the following resources, which are not definitive, may be of use to help address related questions around special education and support educators in their efforts.

Books

- *Designing Effective Math Interventions: An Educator's Guide to Learner-Driven Instruction* (2021) by Jessica Hunt and Jenny Ainslie
- *Humanizing Disability in Mathematics Education: Forging New Paths* (2019) by Paulo Tan, Alexis Padilla, Erica N. Mason, and James Sheldon
- *Rethinking Disability and Mathematics: A UDL Math Classroom Guide for Grades K–8* (2024) by Rachel Lambert

Videos

- *EduTalks: Katherine Lewis & Difference Not Deficit* (2016)
- *The Myth of Average: Todd Rose at TEDxSonomaCounty* (2013)

Articles

- Lambert, R. (2021). The magic is in the margins: UDL math. *Mathematics Teacher: Learning & Teaching, 114*(9), 660–669. https://doi.org/10.5951/MTLT.2020.0282
- Lynch, S. D., Hunt, J. H., & Lewis, K. E. (2018). Productive struggle for all: Differentiated instruction. *Mathematics Teaching in the Middle School,* 23(4), 194–201. https://doi.org/10.5951/mathteacmiddscho.23.4.0194
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- Yeh, C., Ellis, M., & Mahmood, D. (2020). From the margin to the center: A framework for rehumanizing mathematics education for students with dis/abilities. *The Journal of Mathematical Behavior, 58.* https://doi.org/10.1016/j.jmathb.2020.100758

Summary

NCSM: Leadership in Mathematics Education asserts that all students deserve access to equitable and high-quality experiences that empower them to use mathematics meaningfully in their lives, including those with disabilities. Yet, significant disparities persist that require immediate and on-going systemic change. All leaders of mathematics, regardless of their role or title, are called upon to create a shared vision, strengthen collaborative professional communities, support ongoing educator learning, and build strong partnerships to dismantle barriers and ensure every student thrives in mathematics.

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