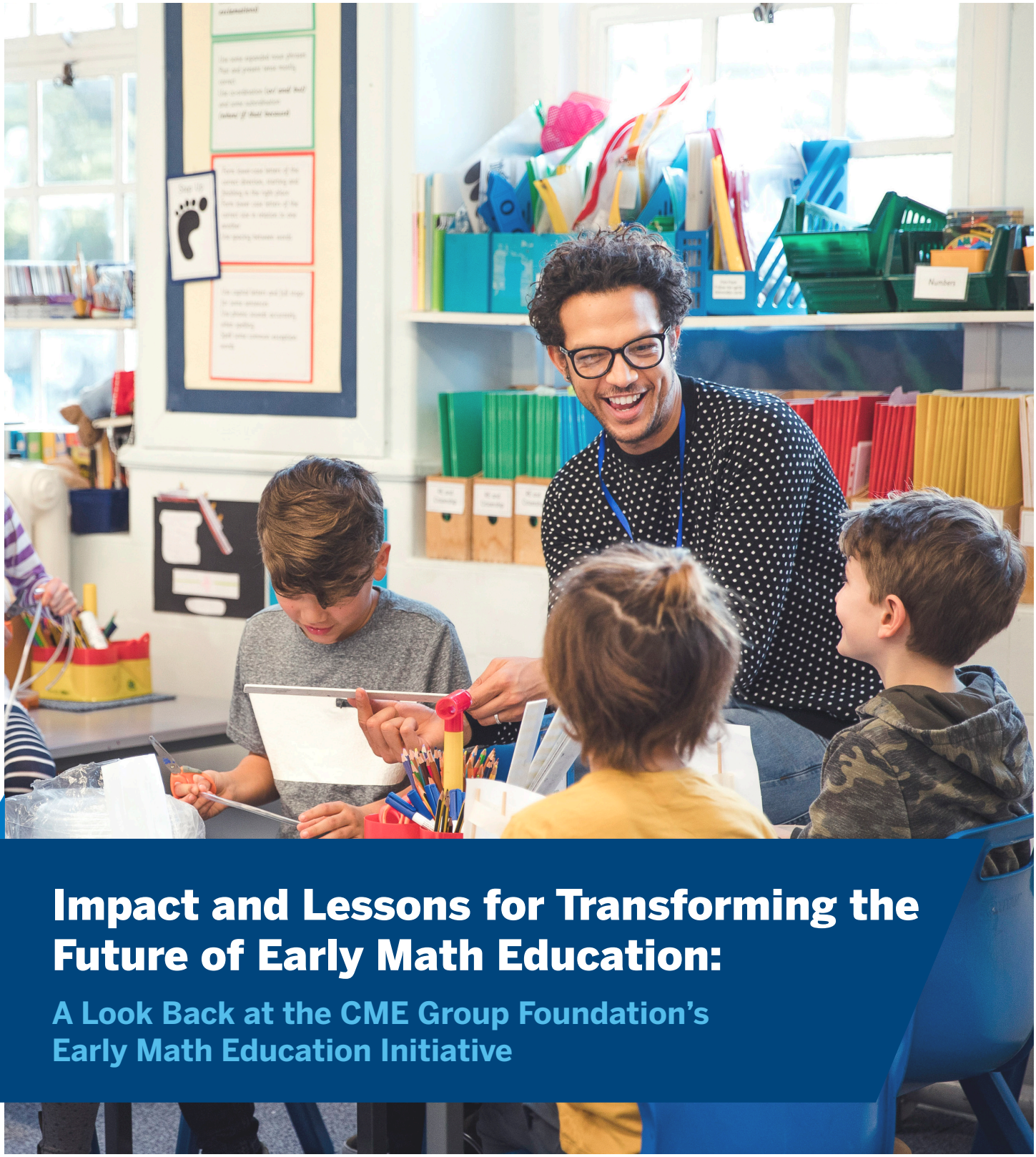
CME GROUP FOUNDATION

December 2020



Impact and Lessons for Transforming the Future of Early Math Education:

A Look Back at the CME Group Foundation's Early Math Education Initiative

Prepared by Arabella Advisors

Introduction

The CME Group Foundation, established in 2007 with an endowment from the Chicago Mercantile Exchange Trust, strives to empower future generations through education. From 2007 to 2020 the foundation invested $11,322,400—representing partnerships with 30 grantees—to improve early mathematics education in Chicago and across the state of Illinois. Over the course of its Early Math Initiative (EMI), the foundation built a strategy rooted in research-practice partnerships that developed, tested, and scaled effective training for early math educators and helped improve their classroom practice and, in turn, student outcomes.

The EMI's work culminated in important developments for the early childhood education field. It advanced the field's knowledge about early math learning and teaching, developed effective professional development curricula and accessible math teaching tools for educators, and built a regional community of practice among education stakeholders and advocates in Illinois who continue to advance this work. It also laid the groundwork for the foundation to launch an impactful sub-initiative in 2016: the Elementary Math Specialist (EMS) pilot program, through which two cohorts of Chicago elementary school teachers have now taken graduate coursework that provides comprehensive math training. The EMS pilot has provided proof of concept for the effectiveness of sustained, intensive professional development that equips elementary educators with specialized content knowledge, pedagogical skills, and confidence to teach math. It has also demonstrated that Illinois' school and district leaders support and need specialized math teachers—which in turn has bolstered ongoing efforts by the initiative's stakeholders to obtain state-level support for new elementary math credentials that would provide pathways for teachers to become credentialed math specialists and school leaders. If these efforts are successful, Illinois will join the 20 other states that have established certification endorsements or similar credentials for specialized elementary mathematics teachers.[1]

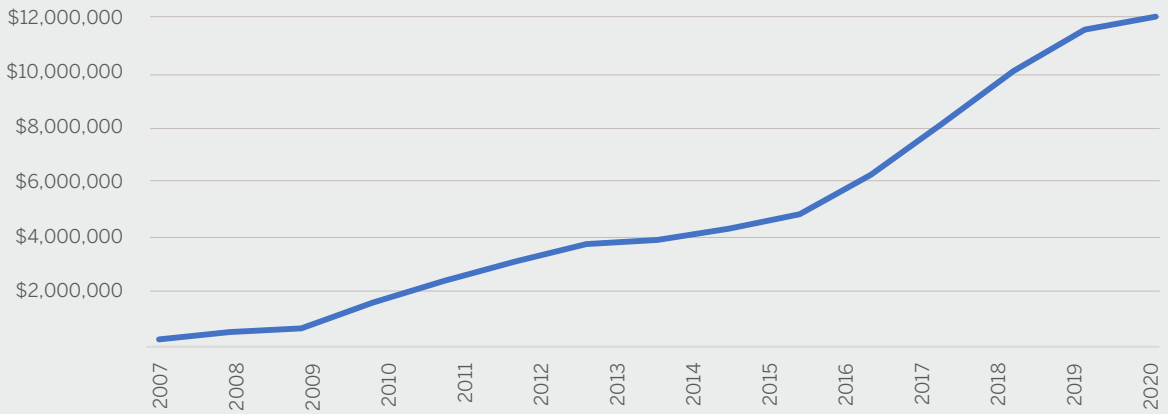
Recent evidence of math improvement among Chicago's students is a promising indicator that the EMI has contributed to measurable change. Whereas Chicago Public Schools (CPS) previously trailed other large urban districts in math and reading scores on the National Assessment of Educational Progress (NAEP), this performance gap closed in the decade from 2009 to 2019. Over this period, CPS fourth graders improved 11 points on the math portion of the NAEP, with scores that improved faster than those of the nation as a whole. The city's education leaders attribute this to several drivers, including research-driven partnerships and decision-making, and an education-focused civic culture including funders who seek to scale school system improvements.[2] Gudelia López, a former senior program officer at the Chicago Community Trust who worked closely with the initiative, commented on these gains: "I had the privilege to learn from and work with CPS math leaders, university faculty and staff members, and Kassie Davis, executive director of the CME Group Foundation, to support CPS teachers in increasing their knowledge and skills to teach mathematics. The NAEP results illuminate CPS' effective strategies in mathematics and partnerships as well as teachers' commitment and effort to improving the education of Chicago's students."[3]

About this report

This report was prepared by Arabella Advisors, a philanthropy advisory services firm that has partnered with the CME Group Foundation since 2016 as a learning and evaluation partner. Arabella conducted in-depth interviews with seven individuals who played critical roles in the Early Math Initiative and Elementary Math Specialist pilot. Interviewees are affiliated with early education funders, academic research institutions, and the Chicago public schools system.

The foundation's EMS grants will conclude at the end of the 2020–2021 school year, and, guided by the lessons it has learned over the course of the initiative, the foundation plans to transition its early childhood focus from teacher preparedness to kindergarten readiness. The foundation is using this inflection point as an opportunity to reflect on the past 12 years of the EMI and EMS pilot. Below, we look back on this work and its most important lessons for other early childhood education advocates who seek to innovate their education systems and equip all students to achieve their full potential.

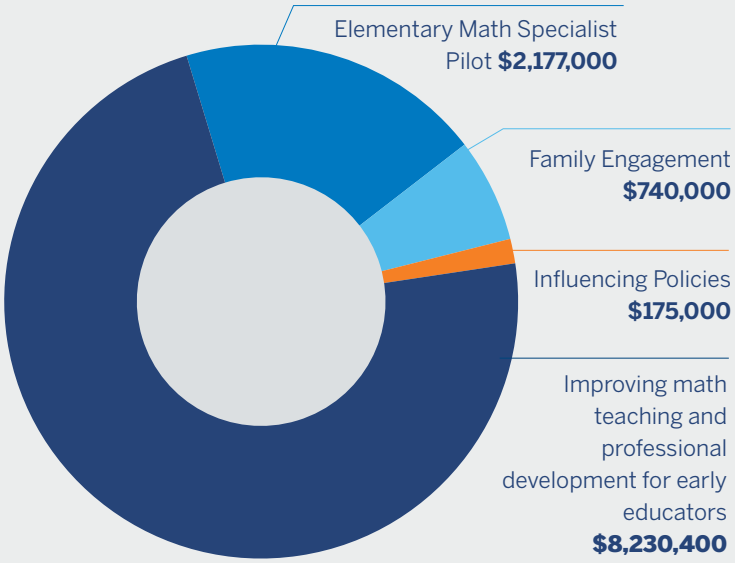
The CME Group Foundation's Investments in the Early Math Initiative



105
grants
made to
30
grantees
totaling

$11,322,400

in early math investments



The Early Math Education Initiative

Advances in early education research in the 2000s provided strong new evidence that building children's math skills early in life equips them for later academic achievement. Whereas the early education field has generally focused on the benefits of early literacy, these newer findings demonstrated that children's early experiences with math concepts are not only equally but likely more important for their later academic outcomes. Studies also demonstrated that early educators can strongly influence young children's capacity to build math skills and use "math thinking"—their intuitive and informal capabilities to understand math themes—highlighting the importance of their caregivers' attitudes about math, and their teachers' preparedness, knowledge, and classroom practices. In light of these findings, the CME Group Foundation made early math education a grant-making priority from its inception in 2007 and partnered with researchers from the Erikson Institute to identify the most impactful ways to train educators to teach math effectively. In 2010, the foundation officially launched its Early Math Initiative with three Chicago-based partners: the Erikson Institute, Big Shoulders Fund, and Ounce of Prevention Fund. The initiative's goal was to help young children in Chicago become proficient in grade-level math by third grade and to be prepared for success in math later in their education. The initiative developed a theory of change that pursued this goal through four avenues:

1. Improved quality of early math instruction, via teachers' increased content knowledge and their confidence to teach it in engaging, developmentally appropriate ways

2. Availability of tools for early childhood teachers to enhance children's early math learning

3. Increased knowledge and confidence among parents and caregivers to introduce mathematical concepts to young children

4. Greater understanding among local education policymakers and university education programs about the importance of early math education, best practices for early math pedagogy, and how to incorporate these instructional practices into the early education system.[4]

The EMI gathered momentum during the 2011–2012 school year, when CPS began transitioning to the Common Core State Standards. The standards included new expectations for how pre-K to fifth-grade teachers should address math concepts, creating a need to improve math instruction, particularly at the elementary level, to effectively teach to the new standard. To identify and address teachers' needs, the foundation built and partnered with a network of other Chicago-based funders, universities, and district personnel working to improve teacher development, capacity, and leadership.[5]

THE EARLY MATH INITIATIVE'S IMPACT

Research advances and partnerships.

Research-practice partnerships were central to EMI's efforts. In the initial years, research partners like the Erikson Institute and its Early Math Collaborative (the math-focused research hub that housed many of the projects the foundation funded) advanced field knowledge about early math pedagogy and developed a framework for high-quality teacher professional development. The Early Math Collaborative's research in the initial years, which developed a deeper understanding of how children learn and experience the world and validated the importance of early numeracy and math thinking, shaped the initiative's efforts. It demonstrated that children's math achievement scores when entering kindergarten were even more predictive of high school graduation rates and later academic success (in both math and other subjects) than the broader field had recognized. Math scores, moreover, were more predictive than early literacy, reading, or socio-emotional skills.

In partnership with CPS, the Erikson Institute also

investigated the implications of these findings for early math teaching and teachers. They found that the mathematics training teachers receive generally has not incorporated cognitive research about how children learn and that elementary teachers often do not feel adequately prepared to teach math.[6] Erikson's 2007 survey of pre-kindergarten CPS teachers found a strong demand for professional development in math instruction. The survey participants also indicated that—more so than in other subjects—they lacked confidence in their own math knowledge and competence.[7] Erikson researchers also found that teachers who are anxious about math inadvertently transfer this "math anxiety" to young students, which in turn constrains the level of math literacy children achieve. By comparison, high school teachers who instruct math are required to specialize in it and do not report having these stressful experiences with the subject matter. Nevertheless, although these findings indicate that teachers would benefit from specialized professional development and math preparation, Illinois' certification programs for kindergarten through fifth-grade teachers have minimal math requirements, and these educators are expected to teach all subjects without content expertise.

One of the critical contributions that grew out of the initiative and Erickson's Early Math Collaborative was the development of a set of "big ideas" of early math, or the essential math concepts that young children should explore between the ages of 3 and 6. With the big ideas as a foundation, the collaborative developed a content-focused approach to professional development for educators that addresses their math knowledge as well as mindsets and attitudes about math. Testing the model with thousands of CPS pre-K and elementary teachers demonstrated that effective math teaching requires educators to have not just "hard" math skills and knowledge, but also the pedagogical knowledge to teach the big ideas in developmentally appropriate ways: for instance, by asking demonstrative follow-up questions or using effective analogies to explain concepts and common mistakes. These findings indicated that for effective learning to happen, it is not sufficient to provide children with math activities and a math-rich environment, and that the field has overlooked the importance of developing educators' pedagogical math knowledge.

In testing its professional development framework for teaching the big ideas, the Early Math Collaborative also evaluated the factors that make professional development effective for elementary math teachers. In addition to being focused on content, this research demonstrated the ways in which professional development should be context-specific, intensive, sustained over time; address beliefs and attitudes; include practical methods for conveying math content; incorporate regular coaching; and be shared in a community of practice. These findings informed how the foundation and its partners designed and implemented the EMS pilot during the initiative's later years.

Developing resources for math educators.
The initiative's grantees developed numerous tools and resources that help teachers and childcare providers improve instructional practices or enhance math thinking in everyday life. The foundation supported the University of Illinois at Chicago to develop Early Math Counts, a website with an extensive, free resource library that includes videos and courses for caregivers and educators of children aged 0 to 5. (See box on page 7.) More than 13,000 educators have completed nearly 74,000 courses through the website, demonstrating the value of accessible online resources for educators without access to in-person programs or learning opportunities.

The Erikson Institute's Early Math Collaborative also compiled the big ideas in its *Big Ideas of Early Mathematics* book, which guided much of the professional development that Erikson faculty conducted in collaboration with other initiative grantees, Chicago's Academy for Urban School

Leadership, and parochial schools to help teachers adapt to Common Core standards. Erikson faculty noted that the long-term funding from the foundation was vital in enabling the institute to translate the book into Chinese and develop associated resources such as videos and webinars, which increased the book's reach.

The initiative also developed new local resources for Chicago-based educators in partnership with two Chicago children's museums: the Chicago Children's Museum and the Kohl Children's Museum. Both museums implemented professional development programs through which educators and childcare providers learned how to put the big ideas into practice using museum field trips, peer reflection groups, and opportunities to plan and practice lessons.

Engaging families and caregivers in early math learning.

Based on research showing that children's family members are their first educators and can strongly enhance their later learning by building early skills and a positive relationship with math, some of the initiative's grants supported family engagement in their children's math learning. For instance, the foundation partnered with Christopher House, a Chicago pre-K and elementary school, with notable results. Christopher House's Early Math Family Engagement Program provided lower-income parents of preschool students with educational resources, a dedicated family advocate, and interactive workshops to promote math learning at home by incorporating math language, skills, and activities in daily interactions with their children. The program's success indicates that math-focused family engagement is a promising approach to closing opportunity and performance gaps for children from low-income households. After its first year, nearly all (98 percent) participating families reported or demonstrated increased engagement with math-related resources at home. Students whose parents had attended workshops also outperformed those whose parents did not, with 92 percent of children showing improved emerging math skills and understanding.[8]

Building early math networks.

Unanimously, interviewees elevated the foundation's network- and partnership-building as one of the initiative's most important contributions to regional progress in math education. In particular, the foundation organized yearly convenings with all EMI grantees—and invited other education sector advocates from its funder and business networks—to foster collaboration and a community of practice among similar-minded organizations. Interviewees said it was critical that the foundation assumed the role of central coordinator because education nonprofits, school networks, and researchers tend to work in institutional silos and face funding pressures that take precedence over networking and collaboration.

Grantees elevated how the convenings created a peer learning network for information sharing and troubleshooting through which they became aware of the work that others were doing in Chicago and across the state. This enabled university and research institutions to better aggregate their expertise. For CPS stakeholders, the convenings promoted mutual learning across districts, allowing teachers, principals, practitioners, and researchers from different schools and institutions to learn from one another's initiatives, and leading to new research-practice partnerships between CPS leaders and other foundation grantees. For stakeholders involved in the EMS pilot, coming together allowed them to learn about the work's impact at different grade levels, helping integrate what were otherwise fractured research streams. Importantly, the convenings also connected grantees to other potential funders and made the initiative's regionally focused work more visible to a broader, national audience of funders.

The Early Math Specialist Pilot

Building on the initiative's learnings and successes, in 2016 the foundation funded the EMS pilot program with partners from the University of Chicago, University of Illinois at Chicago, DePaul

Grantee Spotlight: Early Math Counts

An online professional development sequence for childcare providers, which became the most extensive online professional development resource in the country

With a grant from the CME Group Foundation, in 2012, the University of Illinois at Chicago's College of Education launched the Early Math Counts (previously known as Math at Home) website to give early childhood educators in Illinois the knowledge and skills they need to boost children's mastery of early math.

Successful Outcomes Included:

By building program evaluation into the project from the outset, the researchers and education experts who developed the site demonstrated proof of concept for the effectiveness of online professional development in early math teaching. Teachers and caregivers who completed the course sequence reported improved confidence in teaching early math, refined pedagogical content knowledge, and changes in their instructional practices.

Courses reached family childcare providers, who are often unable to attend in-person professional development due to time, geography, and cost constraints.

Courses have reached a geographically diverse audience and demonstrated a strong demand among educators for accessible, online professional learning as an alternative to traditional face-to-face courses. In 2020, as the COVID-19 pandemic forced much professional learning online, the website saw a large uptick in users across the globe.

University, and CPS. The cohort-based program created a one- to two-year graduate curriculum for pre-K to sixth-grade teachers to gain one of two endorsements: the Elementary Mathematics Teacher (EMT) endorsement, which provided training for classroom teachers who instruct math, and the Elementary Mathematics Specialist (EMS) endorsement, which trained teacher-leaders to coach their school's other teachers and administrators and provide them with professional development in math instruction.

As a result of the pilot, there are currently 45 EMS and EMT teachers from the first cohort in CPS schools, all of whom work in high-needs elementary schools, and a second cohort is ongoing.

THE PILOT'S IMPACT

The pilot improved individual teachers' classroom practices and developed teacher-leaders who helped improve math instruction throughout their buildings, demonstrating the value of offering teachers the opportunity to pursue a math specialist credential. As a result of the pilot's success, the universities and CPS partners involved in the pilot are now pursuing state-level policy change that would scale this work beyond Chicago: In late 2018 they submitted two proposals to the Illinois State Board of Education (ISBE) to establish two new state-approved teaching credentials for elementary school teachers to specialize in math teaching. If these efforts are successful, elementary teachers across Illinois will have the option to earn additional, formal certification credentials. Further, to meet demand from teachers and school districts, many universities and institutions that certify teachers will begin offering EMS courses across the state, which will help scale this work beyond the three Chicago universities that implemented the pilot.

CPS interviewees emphasized that the pilot was impactful within the district because it had clout as a university-based program with courses that counted toward district-approved credentials. This helped to professionalize the concept of elementary specialization for school and district administrators in a way that would have been unlikely through one-off seminars or workshops. This indicates that credential-based programs are a promising avenue for creating buy-in and larger-scale change within school systems. CPS stakeholders also shared that they have begun observing structural impacts of the pilot in several elementary schools where teachers have chosen to specialize in first-grade math, in that administrators have begun to restructure schedules to allow teachers to departmentalize (similar to a high school model). In addition to these observations, researchers involved in the initiative conducted a study on the pilot and the credentials, which demonstrated that there is both a need and strong demand for math specialists in Illinois school districts.[9] This is a promising indication that, should a statewide EMS credential become available, many teachers will have incentives to pursue it.

Impacts of COVID-19

In 2020, the COVID-19 pandemic slowed the progress of the Early Math Initiative and Elementary Math Specialist Pilot. Challenges include:

1. **Difficulty transitioning work with young children to an online format**
   Best practices for effective learning use immersive, tactile learning activities.

2. **Slowed the progress of the pilot's second cohort**
   Teachers participating in the EMS pilot are particularly stretched with the transition to virtual classrooms, leaving limited bandwidth to focus on coursework.

3. **Delayed policy action to approve a statewide EMS credential**
   In early 2020, there were promising indications that ISBE would approve the endorsement by spring or summer. When the pandemic began, the agency de-prioritized initiatives that did not directly help Illinois' school districts implement pandemic-related procedures.

Lessons and Opportunities

LESSONS TO ADVANCE EARLY MATH EDUCATION

The successes and challenges of EMI and the EMS pilot provide valuable lessons for leaders in the early education space and point to opportunities for impact and innovation. The following are lessons for education funders, policy advocates, researchers, and organizations seeking to improve early childhood education systems and outcomes, both within Illinois and in other states.

Recognize that changing educational practices and systems is a long-term play.
The initiative demonstrated that it is important for funders and advocates to recognize that the education field changes slowly, as shifts in educational practice, training, and systems are typically based on field-tested research and depend on state-level legislative action. As such, interviewees cautioned that although one- and two-year grants may spur "small pockets of progress," these gains tend to sputter out without longer-term funding and generally do not catalyze sustainable results. Through renewable multi-year grants to a set of central grantees, the initiative sustained the momentum of several interconnected projects long enough to make measurable progress. For example, the Erikson Institute's research was foundational to the initiative, and this grantee emphasized that extended funding was crucial for enabling it to develop the organizational infrastructure for the Early Math Collaborative that carried out this work (over the course of the initiative, its staff grew from 5 to 22 people). Similarly, research-practice partnerships are important vehicles for change in public education systems, but they require long time frames and substantial investment to build.

Advocates for statewide EMS credentials should identify and build partnerships with state-level allies early in their efforts.
Several interviewees who had advocated for statewide EMS credentials in Illinois said these efforts would have benefited from identifying and engaging state-level allies earlier on, before they had submitted their proposals. In hindsight, investing time at the outset to build buy-in and form partnerships with state leaders and influential advocates, such as teachers' unions who supported the credentials, would have helped initiate and facilitate the approval process.

For others engaging in similar advocacy work—and who do not have state-level partners or relationships—interviewees also recommended investing time and funding up front to research the landscape of relevant stakeholders and learn from comparison cases. In Illinois, the advocates involved in the initiative believe this would have helped them identify whom to engage, to understand ISBE's priorities and processes for approving teacher certification and licensing, and to navigate existing tensions between the agency and CPS. With funding from the CME Group Foundation, grantees from UChicago STEM Education did conduct an extensive landscape study in 2019, after ISBE had reviewed their proposals and requested additional research on the demand for the credential among Illinois school districts and teacher certification programs.[10] In

retrospect, interviewees said that conducting this research—which showed strong support for both the endorsements among Illinois' districts, schools, and pilot participants and yielded insightful lessons—before submitting their proposals would have helped them identify their own information gaps and the success factors for effectively building a coalition in the Illinois context.

OPPORTUNITIES FOR EARLY MATH EDUCATION ADVOCATES

Improving early and elementary math education can have an outsized impact on children's broader educational outcomes. Advocates and funders seeking to take up this charge can do so from many interconnected angles, and the Early Math Initiative demonstrated that improving teacher training and instructional practices are promising avenues for progress. The opportunities below highlight several ways in which education stakeholders can build on the CME Group Foundation's efforts and learnings in these area. While relevant to all education stakeholders seeking to improve math education, some of these opportunities are particularly relevant for addressing challenges related to school performance in math and policy implementation (akin to those faced by CPS in implementing the Common Core standards), and for place-based advocates in states that do not currently have options for math specialization.

Advocate for elementary math specialization as a field priority—both in pre-service teacher training, and in professional development for certified teachers. The initiative and pilot demonstrated that providing intensive, math-specific professional development for elementary teachers can powerfully impact their classroom practices and children's learning. Math education advocates in Illinois and elsewhere—including state policymakers, school districts, degree programs for teachers, and funders—can help transform early math education by creating and promoting opportunities for elementary teachers who instruct math to receive specialist training. Further, the initiative and pilot have demonstrated that sustainable, systems-wide changes to teaching practices will require advocates to focus on teachers' pre-service training to better prepare them with the tools to engage students in effective math learning before they enter the classroom. Because it becomes more difficult to change classroom practices after teachers enter the workforce—when they have little time for additional coursework and face competing pressures from their district's priorities and curricula—changing pre-service training is a promising way to bring the impactful outcomes of the pilot to scale in statewide education systems.

Help school districts develop the resources to shoulder the additional costs of teacher specialization. Credentials and professional development for educators to specialize in math will create additional costs for districts, including the costs of enrolling teachers in the curriculum and/or paying higher salaries for teachers with specialist credentials. This could heighten inequities between the districts that can and cannot afford to train and hire specialists. In the near term, funders can step in and identify opportunities to help support the schools with the greatest needs, as the foundation did in developing the EMS pilot program to focus on high-needs CPS schools. In the longer term, however, districts will also need to develop sustainable funding streams to shoulder these costs on an ongoing basis. Funders and advocates should partner with school districts, and work with state agencies and universities, to develop solutions and explore grant opportunities that allow districts to train and staff math specialists.

Promote equitable access to ongoing professional learning for educators. In designing professional development programs for working teachers, funders and credentialing institutions should consider and identify ways to address barriers that may deter participation. Interviewees indicated that, beyond costs, such barriers can include access to transportation and childcare. To make the EMS pilot more accessible to teachers who wanted to participate, the foundation and its partners designed the program so that course instructors traveled to district schools, noting

that this community-based instruction fostered stronger teacher commitment and engagement.[11] Though this may not be a sustainable long-term model, as it would likely strain instructors' capacity, it demonstrated the importance of considering teachers' constraints in the program design phase and developing incentives for those who deliver professional learning to do so in a way that is accessible and equitable.

Increase educators' access to existing professional development resources. Initiative-funded resources, such as the Early Math Counts website, have made free, online teaching resources widely available to caregivers and educators. The site's leading developer and researcher noted that there is still work to be done, however, to make them more accessible and that demand is growing for these resources to be translated into Spanish and Chinese. Educators also have an increasing need for research and professional development materials that address the math learning needs of children who are not native English speakers as this demographic increases in US public schools. In addition to language accessibility, as the field advances, practitioners highlighted a broader need for compiling or managing teaching resources—such as case studies and classroom videos—so they are more readily accessible, shareable, and easy to include in professional development.

Build collective knowledge and disseminate learnings via convening and networks. Network-building in the spirit of "convening, not competition" was critical to the initiative's successes and helped build partnerships and infrastructure that increase the likelihood that grantees will continue to advance this work. Because education stakeholders often do not have the bandwidth or resources to bring large groups together, funders can have an outsized impact by using their convening power, voice, and networks to build a community of practice.

CONCLUSION

With 12 years of early math grant making under its belt, the CME Group Foundation's successes and challenges point to exciting opportunities for improving early childhood education. The Early Math Initiative and its Elementary Math Specialist pilot program in Chicago have demonstrated that focusing on early mathematics is a powerful means for investing in education systems and children's later academic success. Yet there is still much work to be done to bring these efforts to scale—and many avenues by which funders and advocates can contribute by equipping teachers, families, and children with the math skills that promote a lifetime of achievement.

ENDNOTES

[1] Gudelia López and Martin Gartzman, "Elementary Mathematics Specialists in Illinois," July 2020, https://emsforil.s3.amazonaws.com/documents/EMS_IL_Landscape_Study_web.pdf.

[2] "Chicago's Progress Evident on NAEP," National Assessment Governing Board, https://www.nagb.gov/content/nagb/assets/documents/naep/2020_Chicago_Narrative_FINAL.pdf.

[3] Gudelia López, "From 2009 to 2019, Chicago Public School (CPS) 4th graders improved 11 points and 8th grade students improved 12 points on the math portion of the National Assessment of Educational Progress (NAEP)...," LinkedIn post, November 2020, https://www.linkedin.com/feed/update/urn:li:activity:6733517410428690432/.

[4] Susan B. Munro and Voices for Illinois Children, "It All Adds Up: Early Math Initiatives in Illinois," https://www.cmegroupfoundation.org/files/cme-group-foundation-early-math-initiatives.pdf.

[5] Rafael Otto, "A Decade in the Making: Early Math Education Initiative Seeks Broad Impact," *Principles for Effective Education Grantmaking*, no. 18 (October 2018): 1–31, https://files.eric.ed.gov/fulltext/ED591410.pdf.

[6] Munro, "It All Adds Up."

[7] Munro, "It All Adds Up."

[8] "New Chicago School Program Teaches Parents to Become Their Children's First Math Teachers," CME Group, March 2018, https://www.cmegroup.com/media-room/new-chicago-school-program-teaches-parents-to-become-their-child.html.

[9] López and Gartzman, "Elementary Mathematics Specialists."

[10] López and Gartzman, "Elementary Mathematics Specialists."

[11] López and Gartzman, "Elementary Mathematics Specialists."

Appendix

INTERVIEWEES

	Role	Organization
Kassie Davis	Executive Director	CME Group Foundation
Gudelia López	Former Senior Program Officer for Education Director of Special School Policy Initiatives	The Chicago Community Trust University of Chicago STEM Education
Jessica Mahon	Executive Director of STEM	Chicago Public Schools
Jennifer McCray	Principal Investigator	Erikson Institute Early Math Collaborative
Lizzie McDermott	District Mathematics Manager	Chicago Public Schools
Kathleen Sheridan	Associate Professor of Educational Psychology	College of Education at the University of Illinois at Chicago

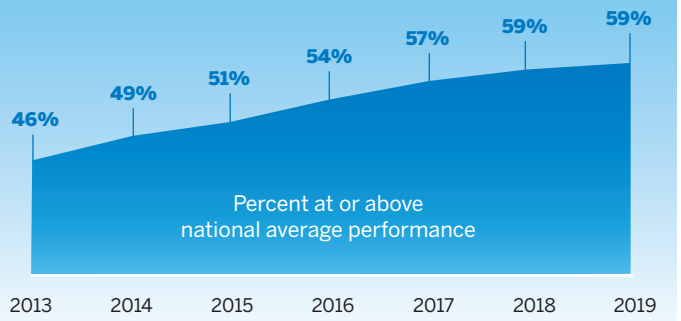
Appendix B

Arabella Advisors prepared the dashboard below to highlight notable outcomes of the Early Math Initiative during the school year 2019-2020.

CME Group Foundation's 2019–2020 Early Math Initiative

Why we continue to invest in early math

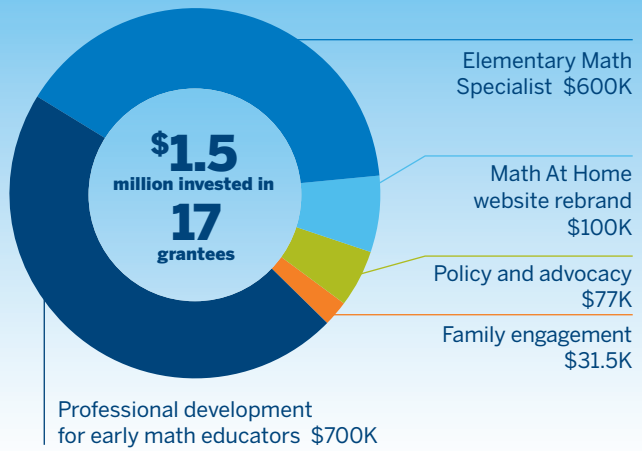
Though math performance has improved over time, 4 in 10 of Chicago's third graders still score below the national average.



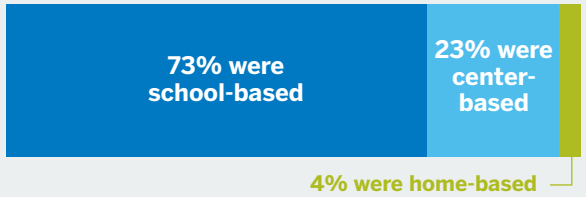
Our commitment over the years

$11.3MM invested since 2007

Our investment this school year



Our grantees trained 440 early learning educators



96% reported improved confidence in teaching early math

95% reported refined pedagogical knowledge

93% reported changes to instructional practice

92% reported increased awareness of how to incorporate math activities into practice

Grantees offered various types of early math professional development to educators, including:

- Professional learning communities
- In-person coaching
- Workshop series
- Courses
- Online training

The **Chicago Children's Museum's** Playing with Numbers program provided professional development to kindergarten and first grade teachers, who reported **significant improvement in 86% (or 850 of 985) of their students' early math skills.**

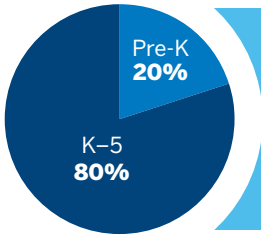
Data sources: Arabella Advisors compiled this dashboard using data provided by the CME Group Foundation's 17 early math grantees in August 2020. Figures on Chicago vs. national performance are from the Northwest Evaluation Association's Measure of Academic Progress. For questions, contact alexandra.bass@arabellaadvisors.com.

With Foundation support, Early Math Counts rebranded its website, which provides free, online professional development for teachers and caregivers of children aged zero to five.

Math at Home ▶ Early Math Counts — Laying the foundation for a lifetime of achievement

Over 13,000 childcare providers completed 73,825 courses through the website

Since the COVID-19 pandemic began, the site's free online resources, which provide an alternative to traditional face-to-face professional development, have drawn an uptick in users from around the globe (with visitors from Australia, Canada, India, the Philippines, and more).



The Early Math Initiative reached 5,077 children

The University of Chicago conducted a study of elementary math specialist credentials in Illinois. **School districts overwhelmingly indicated that Illinois should offer elementary math specialist endorsements:** over 95% of those responsible for curriculum and instruction said Illinois should offer elementary math specialist and elementary math teacher endorsements. The research also showed that elementary school educators who participated in a two-year course to strengthen their mathematics, pedagogical content knowledge, and leadership skills **became more confident in their knowledge and ability to effectively teach math.**

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