

# **The State of Recruitment and Retention of Middle and Secondary Mathematics Teachers in the United States: Analysis and Tangible Actions**

*A White Paper for the Conference Board of the Mathematical Sciences*

## **Introduction**

The teaching shortage across the United States has been well-documented over the past decade (Ingersoll & May, 2012; United States Department of Education, 2023). However, in recent years, the shortage grew worse due to the Covid-19 pandemic. For example, a research synthesis from the Annenberg Institute at Brown University estimates that there were 55,000 teacher vacancies during the 2021-2022 school year (Nguyen et al., 2022). In addition to teacher vacancies, during the 2021-2022 school year an estimated 270,000 positions were filled by individuals without proper teaching credentials or who were teaching outside their field of expertise.

In mathematics, numerous reports indicate that states across the country are experiencing difficulties recruiting and retaining qualified teachers (Zeichner et al., 2024). Moreover, schools across the United States are experiencing dire challenges filling vacancies with qualified teachers, with acute shortages in areas such as special education, elementary education and mathematics (Schmitt & deCourcy, 2022). School-leaders surveyed from high-poverty districts have expressed major concern about the shortage of mathematics, science and elementary school teachers (Diliberti & Schwartz, 2023). The problem is widespread; see the National Center for Education Statistics [National Principals and Teachers Survey](#).

This paper aims to illuminate the state of the mathematics teacher shortage across the United States and advocate for actions that would improve the recruitment and retention of

qualified mathematics teachers. Understanding the situation is challenging due to inconsistencies that exist from state to state in terms of their requirements for certification, the protocol used for reporting data such as teacher demographics, entries, and vacancies, and the definition of key terms such as shortage, recruitment, and retention. In addition, the state of the teaching profession varies across rural, urban, and suburban settings, as well as across geographical regions of the United States.

For these reasons, we have gathered, analyzed, and synthesized data from a variety of sources across the nation and provided examples and illustrations that represent different geographical regions in the United States, as well as in rural, urban, and suburban areas to provide a clearer picture of the mathematics teacher shortage across the nation.

We have organized our discussion into sections around five key questions:

1. Who is teaching mathematics?
2. What is the state of the mathematics teacher shortage?
3. What is the state of mathematics teacher entry and certification?
4. What are retention rates of mathematics teachers in United States public schools?
5. What are the promising practices of mathematics teacher recruitment and retention?

In each section, we begin by defining and clarifying relevant terms, followed by a thorough analysis of current research and data. The concluding section offers recommendations for policymakers, mathematics teacher educator preparation or certification programs, and school and district leaders.

## Who is teaching mathematics?

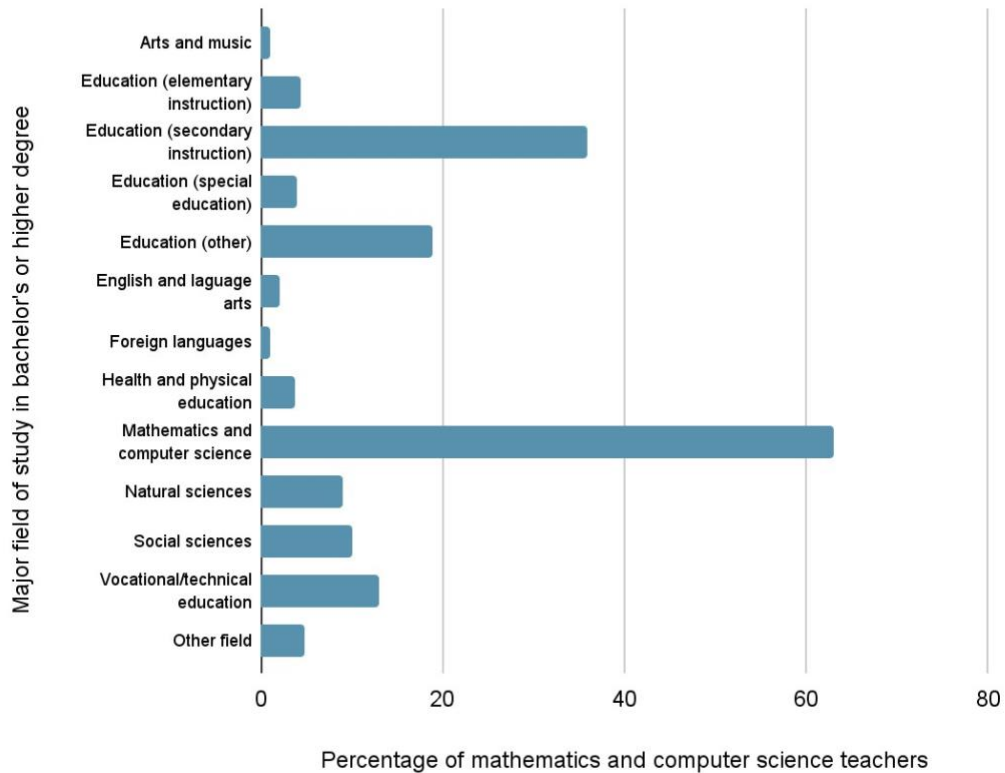
To understand the shortage of mathematics teachers, it is important to know who *is currently* teaching mathematics. When searching for national data on teachers, we observed that information is often not disaggregated to allow us to focus on mathematics teachers. For example, the 2021 National Teacher and Principal Survey by the National Center for Education Statistics (NCES) grouped together data on mathematics and computer science teachers. In the 2020 -2021 school year, 169,900 mathematics and computer science high school (grades 9-12) teachers responded to the survey (NCES et al., 2022). A majority of mathematics and computer science teachers started teaching when they were 25 years old or younger and had a master's degree. Thirty eight percent of these teachers had 10 to 20 years of teaching experience. In the 2020-21 school year, mathematics and computer science teachers mostly held a degree in that field, that is, mathematics teachers had a degree in mathematics and computer science teachers had a degree in computer science, followed closely by secondary education instruction as seen in Figure 1. This survey records that approximately 23% of mathematics and computer science teachers in public elementary and secondary schools reported that they entered the field through an alternative preparation route.

Demographic data on mathematics teachers are not available for every state and vary by state in how much information is provided. The national picture that mathematics teachers are predominantly female holds true in several states; for example, 53% of Arizona's mathematics teachers in the 2020-21 school year were female (Arizona Department of Education et al., 2021). Eighty percent of Texas mathematics teachers are female, which has remained consistent over the past decade (Horn et al., 2021). Arizona also reports that 10% of the 930 emergency certified teachers and 9% percent of the 1,509 full time substitute teachers employed in the 2020-21 school year taught mathematics (Arizona Department of Education, 2021).

**Figure 1**

*Majors of mathematics and computer science teachers in 2020-21 school year for their bachelor's degree or higher*

Major field of study in bachelor's or higher degree of mathematics and computer science teachers in 2020-21 (NCES et al., 2021)



The types of credentials mathematics teachers hold also varies widely. Nationally, the American Association of Colleges for Teacher Education have published reports claiming that “teacher-preparation enrollment and completion numbers have stabilized, and even grown slightly, after years of sharp declines” (King, n.d.). While true for the teaching profession

overall, looking specifically at mathematics, in the states for which data were available trends were mixed.

In California, new teacher credentials issued between 2017-2023 have decreased, although there was a brief uptick in the 2020-2021 fiscal year. At the same time, during the fiscal years 2018-2023 increases and decreases in credentials issued via local education agencies (LEA) or alternative pathways have oscillated from year to year (California Commission on Teacher Credentialing, 2023). By contrast, in Texas there was a sharp uptick in total mathematics credentials issued between 2017 and 2018, although credentials obtained from a standard program have steadily been decreasing over time as of 2022 (Texas Public Information Resource, 2023.)

Overall, finding data on who is teaching mathematics is challenging due to the use of varying categories by different reporting agencies. Despite these challenges, we can say that teachers of color are underrepresented in *who* teaches mathematics in the United States, and that variation exists among states in *paths toward credentialing* although data suggest that fewer teachers are going through traditional training pathways.

### **What is the state of the mathematics teacher shortage?**

We define a *teacher shortage* to mean an inability to fill vacancies with credentialed individuals, that is, individuals who have certification in the discipline or grade level in which they are teaching.

Across the nation, schools are facing challenges as they seek to fill mathematics vacancies with qualified teachers. Podolsky et al. (2016) report that middle and secondary mathematics has been identified as a national critical shortage area since 2014. The shortage has, at best, persisted since that time. Data aggregated from the National Conference of State



Figure 2 shows that teacher shortages are prevalent across the United States. It should be noted that shortages may exist in Kansas, Missouri, and Alaska, even though we did not find data showing a mathematics teaching shortage in those states.

Although the national number of credentialed teachers exceeds the number of vacancies (Institute of Educational Sciences [IES], 2022) many school districts report difficulties in finding *mathematics* teachers (IES, 2022; Lieberman, 2022; NCES, 2022; Schmitt & deCourcy, 2022). In the 2020-21 *National Teacher and Principal Survey* (NCES, 2022) respondents reported that it was either very difficult or they were unable to fill teacher vacancies in public schools across various subject areas with mathematics ranking very high, fifth out of thirteen with almost 32% (Special education, physical science, English as a Second Language, and foreign languages were slightly higher than mathematics). Additionally, an average of 63% of school districts across the nation cite that too few candidates apply for open mathematics positions or that candidates are not well-enough qualified to fulfill the responsibilities of the role for which they have applied (IES, 2022). The state of New York reports that, on average, less than three applications are submitted for each mathematics vacancy (Elsen-Rooney, 2023). In the Midwest, 75% of districts report a lack of qualified applicants for open mathematics teaching positions (IES, 2022). These data together point to a strong need for qualified applicants to fill numerous vacancies in mathematics.

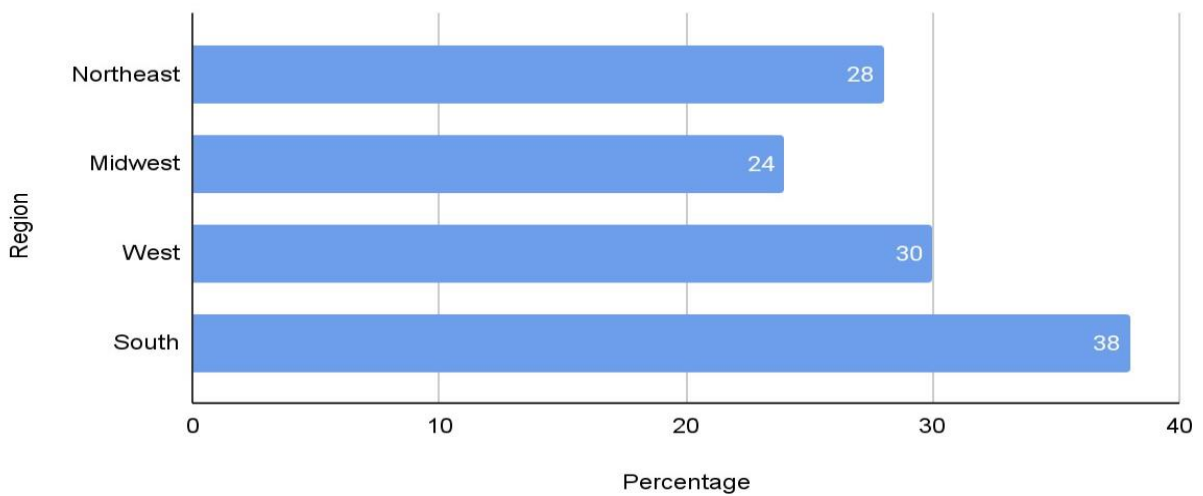
Research further indicates that teaching shortages are highly localized, with more concentrated shortages in schools with low academic performance and high economic need (Ingersoll & May, 2012; Sanderson Edwards et al., 2023). According to the IES (2022), approximately 33% of impoverished schools reported vacancies in middle and secondary mathematics. To illustrate, during the 2019-2020 school year, Tennessee's teacher vacancies were concentrated in 25% of the state's lowest performing schools (Sanderson Edwards et al., 2023).

In analyzing mathematics teacher shortages by region, the highest percentage of districts with a shortage lie in the South, with 38% reporting mathematics as an area of shortage (IES, 2022). Figure 3 illustrates the struggle for credentialed mathematics teachers across different regions of the United States.

**Figure 3**

*Percentage of U.S. Public Schools with Mathematics as a Reported Shortage, (IES, 2022)*

**Percentage of United States Public Schools with Mathematics as a Reported Shortage in 2022 (by region)**



This discussion points to widespread teacher shortages in mathematics but suggests that there are multiple factors that account for the variation of the shortage across the United States. These are important considerations as we examine pathways to mathematics teacher preparation.

**What is the state of mathematics teacher education entries and certification?**

There are currently many forms of teacher preparation. In this report, we define higher education institution degree-earning (Bachelors or Masters) programs as *traditional pathways* to teacher certification. In some of these programs, students major in mathematics education, or



major in mathematics while taking generalized education courses. There are also a growing number of mathematics teachers who obtain their credentials through *alternative certification programs* (ACPs). We define ACP as a program that is not directly affiliated with a higher education institution.

The overall number of individuals entering mathematics education is decreasing. According to data from the Higher Education Research Institute at the University of California at Los Angeles, in 2020 just over 4% of college freshmen are pursuing a career in education, a steep decline since the 1990s and early 2000s when it had held steady at 10-11% (Schmitt & deCourcy, 2022; Lieberman, 2022). This suggests that there is a decline in interest among students in becoming teachers.

In Texas, the data show that initial mathematics certifications are most common in the 4-8 and 7-12 grade levels, approximately 40% and 51% respectively. Over the past decade in Texas, the two main producers of mathematics certificates have been for-profit ACPs at 37.2% and public universities at 39.2%; see Table 1. Data from 2010-2019 show that the number of mathematics teacher certificates in Texas has decreased from 2,083 to 1,356, representing a decline of 35% (Horn et al. 2021). There has been an 11% drop in 4-8 mathematics certificates and a 17% drop in 9-12 mathematics certificates since 2020 (NCSL, 2023). Interestingly, there has been a 21% rise in full-time equivalent (FTE) mathematics teachers during this same period, increasing from 44,743 to 53,944.

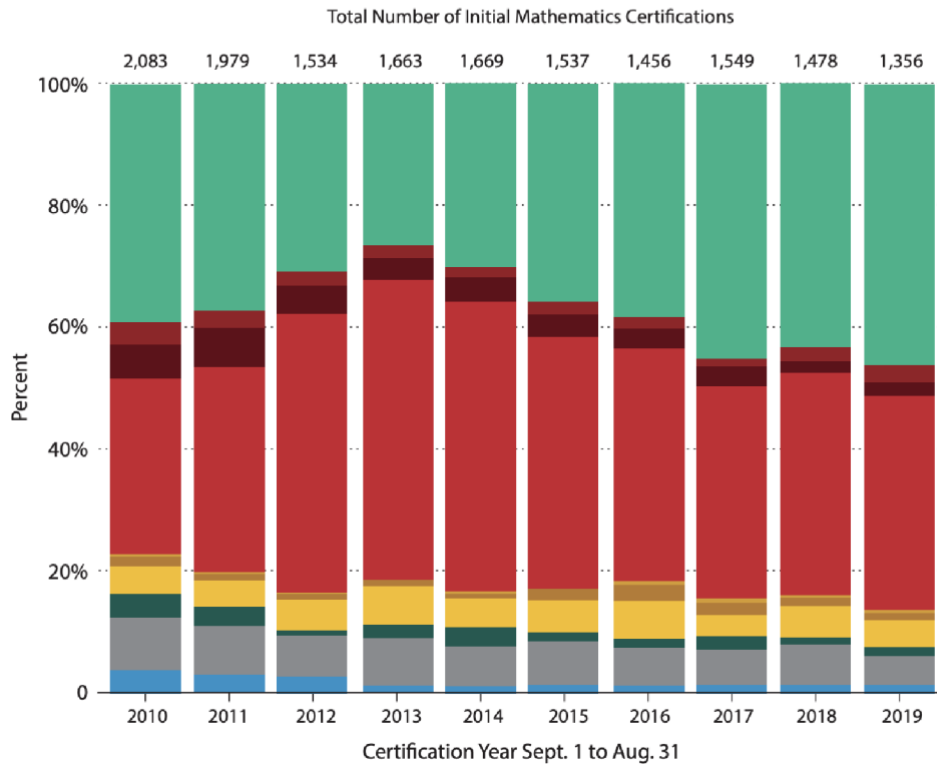
In California, recent data show that there are substantial disparities in teaching qualifications. Out of the total teaching Full-Time Equivalent (FTE) positions, 83.2% hold

**Table 1**

*Texas Certification type by Educator Preparation for 2020 (Horn et al, 2021), Figure 2.12*

**Mathematics Teacher Certification by Educator Preparation Type**

- Public Universities (Standard)      Independent Universities (Standard)
- Public Universities (Alternative)      Independent Universities (Alternative)
- Public Universities (Post-Baccalaureate)      Independent Universities (Post-Baccalaureate)
- For-Profit ACPs (Alternative)      Independent School District ACPs (Alternative)
- Community Colleges (Alternative)      Education Service Centers (Alternative)



credentials. The remaining 16.8% fall into categories such as "out of field" (4.1%), "intern" (2.3%), "ineffective" (3.5%), "incomplete" (6.6%), and "unknown" (0.2%) (NCES, 2023).

Ohio also faces challenges in mathematics teacher certifications. Mathematics (7-8) is the second most taught middle and high school course by teachers without proper certification, just

behind special education classes. In the 2021-2022 school year, there were 327 courses taught by 153 uncertified teachers. Other courses on this list include Algebra I in high schools (235 courses, 107 teachers), Geometry (HS) (229 courses, 103 teachers), and Algebra II (HS) (152 courses, 92 teachers); in the larger picture of high school mathematics courses in Ohio, that means 2.9% to 4.0% of all teachers of these courses were without proper certification. Furthermore, enrollment in Ohio's teacher preparation programs has decreased by 19% from 2015 to 2020 (Ohio Department of Education, 2023).

Echoing national trends, New York also reports a significant discrepancy between the number of individuals enrolled in teacher education programs and the number of certifications awarded, with only one-third of those enrolled in teacher education programs estimated to complete their programs and become certified to teach (Garcia & Marmor, 2023). Considering the drop to only 4% of college freshmen entering teacher education mentioned above, a small portion of those students completing programs raises the question: what is preventing students not only from considering education as a career, but also preventing them from finishing their teacher education programs. This problem is a factor in the diminishing number of teachers joining the teacher workforce.

Based on the data presented, it is evident that there is a shift in the way mathematics teachers are obtaining their credentials. Alternative certification programs are becoming more popular, while the overall number of individuals entering university mathematics education is decreasing. Moreover, the overall production of certified mathematics teachers is not rising to meet the demand. It is crucial to address this decline and ensure that qualified and certified mathematics teachers are available to meet the educational needs of students.

## **What are the retention rates of mathematics teachers in United States public schools?**

The recent focus on teachers leaving the profession, particularly since the pandemic, has prompted research into retention rates, recruitment, and other aspects of the teacher preparation pipeline (Ingersoll & May, 2012; Nguyen et al., 2022). Research typically addresses teacher turnover and attrition rates, along with retention rates of both new teachers entering the field and those who have more experience. Attrition is generally defined as teachers leaving the profession, whereas retention focuses on the teachers that choose to stay at their current placement or in the profession.

Science, mathematics, and special education teachers tend to be at a higher risk for leaving the profession than other teachers (Nguyen, 2020; Carver-Thomas & Darling-Hammond, 2017). In Texas, the 10-year retention of first-year mathematics teachers who started in 2010 was on average 47.4% (Horn et al., 2021). In the 2021-22 school year in Georgia mathematics teachers had an average retention rate of 44.3% (Flamini & Wang, 2024). Since the start of the pandemic, Arkansas's secondary mathematics teacher retention rates have remained consistent at approximately 76%. However, the retention rates for middle school mathematics teachers in Arkansas have decreased by about 4% (from about 78% to 74%) from the four years before Covid-19 to the four years after the pandemic (Camp et al., 2024). The retention rate statistics for Georgia and Arkansas include all mathematics teachers in those states and do not distinguish between other demographics.

Specific retention rates for mathematics teachers in each state are not readily available, but general data about all teachers indicate some trends. Data indicate that mathematics teachers credentialed through alternative certification programs tend to have less longevity in the field. In Arkansas, teachers certified through traditional educator preparation programs have a retention rate of 73%, with every other route having rates lower than 65% (McKenzie et al., 2023). Texas

reports similar findings with a 12% differential in retention between standard certification through a university and for-profit alternative certification programs over the past decade (Horn et al., 2021; Texas Education Agency, 2023). In Alabama, “retention of non-traditionally certified teachers is substantially lower than those of the traditional route” (Alabama Commission on the Evaluation of Services, 2022, p. 1). Results from a 13-year study found that only 51.6% of emergency certified teachers eventually became licensed teachers. Moreover, only 32% of emergency certified teachers that started in 2018 were still employed as a teacher in 2022 (Alabama Commission on the Evaluation of Services, 2022).

Several other factors appear to affect retention rates for teachers overall and thus has implications for those that are mathematics teachers. First, retention rates are better in low economic-need schools compared to higher-economic-need schools (Collins & Schaaf, 2020; Horn et al., 2021; Ingersoll & May, 2012; McKenzie et al., 2023). Second, retention rates vary by level of teacher experience. In general retention rates in Missouri districts for all teachers have been decreasing from 88.3% in 2019 to 82.8% in the 2022-2023 school year (Missouri DESE, 2023). This data also indicates that first, third, and fifth-year teachers in Missouri tend to have lower retention rates than teachers with more than five years of experience (72.1% for first year teachers compared to 84.8% for tenured teachers). This trend is also seen in data from Texas (Texas Education Agency, 2023). In Tennessee, there has been a decline in recent years in the percentage of teachers who report that they plan to remain in education (Binstead, 2023). In this same report, approximately 8 in 10 Tennessee teachers reported that while they do plan to continue to teach in their current school, fewer indicated that it was part of their long-term career goals in education.

When looking at the data by race and ethnicity, retention rates also vary. In Arkansas, Tennessee, and New York, teachers of color have a lower retention rate (Collins & Schaaf, 2020;

McKenzie et al., 2023; New York Equity Coalition, 2023). However, this is not the case everywhere, such as in Texas (Horn et al., 2021). The Texas data reports that Hispanic teachers have the highest retention rate (60% over 10 years), followed by Black teachers (50% over 10 years) and White teachers (45% over 10 years). Similarly, from 2020-2021 to 2021-22 school years in the District of Columbia, Asian teachers had the highest retention rate at 82%, followed by Hispanic teachers (78%), White teachers (76%), and Black teachers (72%) from the 2020-21 to 2021-22 school years (Office of the State Superintendent of Education, 2022). Additionally, a Tennessee study discovered that early-career teachers, teachers of color, and teachers in schools with high economic need are more likely to leave the profession or transfer schools despite an increase in these teachers reporting intentions to continue teaching in their schools from 2022 to 2023 (Binstead, 2023).

While retention rates vary across multiple demographic and contextual factors, it is clear that there is a need to attend to who is remaining as a teacher of mathematics and who is not.

### **What are promising practices for teacher recruitment and retention?**

This qualified teacher shortage has prompted educational stakeholders to develop creative and innovative practices not only to support teacher development, but also retain teachers in the profession. This prompts two questions: 1) What types of practices or programs have been developed to recruit and retain teachers? and 2) How effective are these practices and programs? We provide examples below.

**Teacher residency programs** offer one example of a promising pipe-line strategy for mathematics teacher recruitment and retention. According to Coffman and Patterson (2014), “a teacher residency is a mutually beneficial partnership between preparation providers and districts, one in which the integration of clinical experiences and coursework throughout the

preparation program is co-designed to strengthen teacher preparation and improve schools and learning in the partner districts (p. 1).” This model holds promise, as it simultaneously addresses recruitment issues while building capacity to offer high-quality instruction to students (Podolsky et al., 2019; Zelkowski et al. (2024)). Multiple states and institutions have experienced success in the implementation and development of teacher residency programs. For example, House Bill 11, recently passed in Texas, allocates funding for districts to pay for teacher residencies, where apprentice teachers are partnered with a mentor teacher for a year and then hired the following year, all while getting paid between 22,000-44,000 dollars (Texas House Bill 11, 2023).

Additionally, there are organizations committed to creating networks of support for the development and maintenance of teacher residency programs. For example, the National Center for Teacher Residencies (NCTR) currently has partnerships with forty-seven programs housed in twenty-six states (*NCTR Annual Report 2022-2023*, n.d.). Overall, the support provided by this organization has been successful, as 69% of residents housed within NCTR programs for 2022-2023 identify as persons of color and 86% of teachers were retained after three years.

A second strategy is described as a **grow-your-own (GYO) program**. Diliberti & Schwartz (2023) claim that, “the rapid rise of grow-your-own programs in particular holds promise to not only build up the pipeline but also racially diversify it (Education Trust, 2022; Podolsky et al., 2019).” Podolsky et al. (2019) define GYO programs as programs that “motivate and expose individuals to a career in education” (p 25). The ways in which grow-your-own programs are set up have wide variation across all 50 states in terms of definition, implementation and resource allocation (*A 50-State Scan of Grow Your Own Teacher Policies and Programs*, n.d.). The most common type of GYO program involves a high-school pathway where students are exposed extensively to careers in education (*A 50-State Scan of Grow Your Own Teacher Policies and Programs*, n.d.). Many states are starting to invest in infrastructure for

developing these programs with the idea of recruiting teachers and potentially impacting retention rates. For example, as of January 2022, Tennessee has been approved by the US Department of Labor to establish a permanent GYO model that will support communities and teachers across the entire state (*Grow Your Own*, n.d.).

These two strategies, residency and GYO programs, focus primarily on recruitment and retention of new teachers. What about teachers who are already in the field? The University of Arizona Center for Recruitment and Retention (CCR) of Mathematics Teachers is an institutional, community-based program that, according to its website (<https://crr.math.arizona.edu/about-crr/overview>), aims to do both by “attract[ing], develop[ing] and support[ing] new mathematics teachers through innovative programs.” This is accomplished through nine programs, all of which serve to aid in the professional learning and development of newly minted and experienced teachers. For example, CRR offers induction programs for newly credentialed teachers as well as professional development conferences for teachers in Arizona to come together and share knowledge and experiences (Center for Recruitment & Retention of Mathematics Teachers, 2023).

Additional promising practices point to the need to provide teachers with strengthened continuous, high-quality, **professional development** opportunities that support teachers in ways that value their learning and commitment to teaching. A report for the Economic Policy Institute by Garcia and Weiss (2019) stresses the importance of continuous learning for teachers as it “helps teachers keep up with advances in research on effective teaching and learning and with the changing demands of the profession” (p. 36). It goes on to say that continuous learning can help support a stable workforce of teachers and enhance respect for and within the profession. Although this report addresses the teaching profession as a whole, it has promise specific to mathematics teachers, noting that support through continuous learning can play an important role



in teacher recruitment and retention and claiming, “efforts to establish a system of supports and a real learning community would also help address the teacher shortage” (p. 37).

According to Smet (2022), teacher professional development has potential to impact job satisfaction and could in turn impact teacher retention. But this is complex since the type, length, need and focus of the professional development activity varies. To illustrate the claim, in a case study in rural Colorado (Colorado Rural Education Collaborative, 2020) partnerships across a variety of stakeholders were formed to work with high needs rural schools in Colorado to reduce the teacher shortage and improve the quality of mathematics instruction “through professional development/coaching, continuing education, and community building for current and preservice teachers” (Executive Summary). The study found that at least 90% of the participants remained in the teaching profession and/or in their same school the following year, with retirement being the only reason for not continuing to teach.

Misconceptions about the teaching profession also need to be identified and combatted. [\*Get the Facts Out\*](#) (GFO), a five-year National Science Foundation (NSF) funded partnership with Colorado School of Mines and four national STEM societies (American Physical Society, The American Chemical Society, the American Association of Physics Teachers, and the Association of Mathematics Teacher Educators), works to reach STEM majors in the U.S. interested in teaching mathematics and science to “repair the reputation of the teaching profession”. While GFO acknowledges that we have a severe shortage of mathematics teachers in the United States, it finds there are many misconceptions about the profession that could and should be countered to help address the teacher shortage, particularly in high-need areas of STEM.

GFO is based on research outcomes from large scale studies lead by Dr. Wendy Adams [see [GFO](#) website for more detail] that include student interviews and surveys to develop,

validate, and ultimately utilize the *Perceptions of Teaching as a Profession* (PtaP) instrument. Findings indicate that many students do not consider the teaching profession because of the many misperceptions they had related to teaching. Misperceptions spanned from misunderstandings of salary to how they view their lives in relation to their occupation.

Based on these findings, GFO has begun to address many of these misperceptions by providing resources that can be shared with teacher educators, prospective teachers, PK-12 student advisors and counselors, parents and families, policy makers, and others who interact with students about their future careers. These resources range from presentation files, videos, data handouts, program templates, brochures, infographics, and social media content, all of which can be modified to fit the specifics of a program and audience. GFO's [2022 NSF annual report](#) notes that the partnership is working to spread the word about these resources and also has found that there has been significant perception improvement, with many students shifting from a negative to a positive indication that they would want to be a grade 7-12 teacher. This research is ongoing but shows promising results.

These promising practices for recruitment and retention are grounded in developing partnerships across varying stakeholders and institutions that support K-12 education. Teachers need to feel supported in their chosen profession and connections across institutions may facilitate that support. Teachers do not exist in a vacuum; coordinated efforts to retain and sustain teachers in the profession are critical.

### **Recommendations**

Our analysis has positioned us to propose recommendations for policymakers, colleges and universities, mathematics teacher educators, and school and district leaders to consider adopting to address the mathematics teacher shortage. We offer recommendations aimed at

addressing the mathematics teacher pipeline---including traditional educator preparation as well as alternative certification programs---as well as recommendations to support the retention of qualified mathematics educators.

**1. The mathematics teacher shortage exists, is widespread and needs to be addressed.**

While specific data is often difficult to obtain, the analysis presented here demonstrates that the shortage is real and serious. Although the extent and severity of the shortage varies by geographic region and socioeconomic circumstances, the overall picture demands attention nationally.

**2. Uniform data reporting protocols and a common vocabulary need to be developed.**

Policymakers should consider developing common vocabulary within states and districts and possibly across states to enable more efficient reporting, collection, and communication about teacher recruitment and retention data. Improved data reporting also could include information about the certification completion and different types of certifications (i.e. initial, professional, emergency, etc.). Uniform data reporting protocols would help to identify and quantify shortages in a timely fashion. The lack of consistency made our analysis challenging and our findings less precise than we would have liked.

**3. Partnerships hold promise and need to be encouraged.** Partnerships of various kinds hold promise for not only recruiting qualified teachers but retaining them. For new teachers, both Grow Your Own (GYO) and residency programs hold great promise. For in-service teachers, high quality professional development programs like the University of Arizona's Center for Recruitment and Retention can play an integral role in supporting teachers. Additionally, a group such as Get the Facts Out can help to dispel harmful myths about the teaching profession.

**4. Funding to support the mathematics teaching profession needs to be robust and sustained.** Programs to recruit, retain, and support mathematics teachers require robust and sustained funding. To change the current landscape of mathematics education requires tangible support from schools, districts, and policy makers at the local, state and federal level. Real change occurs through collective commitment.

### **Conclusion**

The mathematics teacher shortage is pronounced and prevalent across the United States. With fewer individuals entering the mathematics teacher pipeline and low retention rates, we should all be concerned about the United States' long-term ability to provide all students with high-quality mathematics instruction. Addressing this crisis will require a collective commitment to increase and sustain the mathematics teacher workforce.

### **Key Take-Aways**

- The recruitment and retention of mathematics teachers remains a crisis in United States schools.
- Hiring, recruitment, and retention practices differ across and within states and geographic regions.
- Data gathering to report teacher shortages and vacancies is inconsistent across states.
- Promising practices for recruitment and retention are grounded in developing partnerships across varying stakeholders and institutions that support K-12 education.
- Partnerships and funding are central to addressing the mathematics teacher shortage and providing potential solutions.

## **Additional Resources**

- [Get The Facts Out](#)
- [RAND Report: Educator Turnover Has Markedly Increased, but Districts Have Taken Actions to Boost Teacher Ranks](#)
- [Education Week Article: How These State and District Leaders Are Solving Teacher Shortages](#)
- [Education Week Article: What Will Teacher Shortages Look Like in 2024 and Beyond? A Researcher Weighs In](#)
- [National Conference of State Legislatures Database on Teacher Shortage Areas by State](#)
- [National Academy of Education Paper: Landscape of Teacher Education Programs and Teacher Candidates](#)
- [Math for America: Master Teacher Fellowship program](#)

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