lastinger listening tour

Importance of School Mathematics Beyond High School

UF | Lastinger Center for Learning
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Helios Education Foundation

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In the Fall of 2023 we conducted a listening tour across the state of Florida in an effort to understand the current state of mathematics education. This brief reports on what we learned from a variety of stakeholders about the types of mathematical experiences students need for success beyond high school. For a comprehensive report of the Listening Tour and our methodology visit bit.ly/LCListeningTour.

Key Finding: Mathematical Thinking and Reasoning in High Demand for all Careers

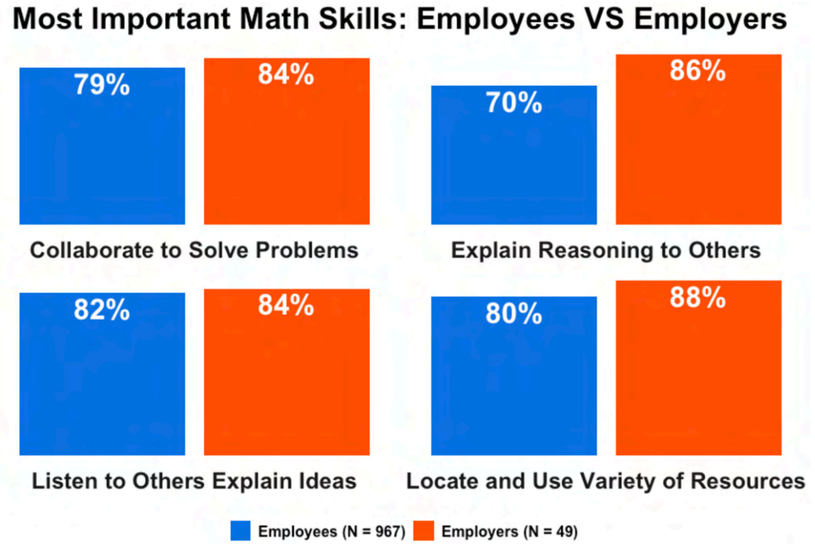
Across 84 focus group conversations with 284 educators, administrators, parents and business professionals from across Florida, when asked about the importance of mathematics, there was consensus that it was vital for personal and professional success after high school. However, there was less clarity around the specific content required for success in post-secondary careers. When asked about the mathematics people should learn, conversation tended to focus on a general notion of basic math or number sense, financial literacy, algebra and data and statistics—the use of spreadsheets was ubiquitous. However, other content areas also surfaced, and were dependent on particular job needs (e.g., geometry was important in the construction industry). But when it came to the types of mathematical practices that are outlined in the Florida B.E.S.T. Mathematical Thinking and Reasoning Standards (MTRs; FLDOE, 2020), there was widespread consistency in the demand across workforce sectors.

In particular, when discussing the need for mathematics, it was common for discussion to focus on critical thinking and reasoning, problem solving, collaborating and communicating with mathematics. This included the use of mathematics to engage in creative problem solving, critically consuming quantitative information, explaining mathematics and mathematical processes to others, persevering through complex problem solving situations and effectively collaborating with others.

> *"They should be able to critically think and use some order of progression- which probably is algebra- but they need to be prepared for that. Because, if somebody can critically think and if they can apply logic, they can learn anything."*
>
> **- North Central Florida Business Leader**

Focusing on the interviews with business leaders, these specific topics came up in 86% of interviews. When asked about the most important skills as an employee or employer on the survey, the top skills were remarkably similar. Moreover, when talking about the mathematics they engage in for their particular job roles, they frequently described these same kinds of practices. In other words, employees and employers alike were sending the message that mathematics is not just calculations and procedures.

> *"I don't care if you've got the right answer if you can't tell me how you've got the right answer because... I'm trying to understand how you think and- you don't have to think like me- I just need to understand that you have a thought process"*
>
> **- North Central Florida Business Leader**



In fact, memorizing rules, procedures, facts and formulas (30%) and using mental math (53%) were among the least frequently reported skills important for success beyond high school in the survey.

> ***"The ability to come into any situation, understand the components of that situation, understand what's being asked of them and how to solve it. And ultimately, if you distill math, I believe that's what it is."***
>
> **- North Central Florida Business Leader**

Comparing these important skills for success beyond high school with the MTRs, there is a clear relationship to several standards, especially those that encompass collaborative real-world problem solving (MTR.1.1, MTR.5.1, MTR 7.1), reasoning about and with mathematics using multiple representations and drawing connections across mathematical ideas (MTR.2.1, MTR.5.1) and explaining, justifying, and engaging in active discourse about others' mathematical reasoning (MTR.4.1).

Top 5 Requests from Employers

1. More Teacher Training
2. Higher Teacher Pay
3. More Highly Qualified Teachers
4. High Quality Instructional Teachers
5. Family Support

When asked about what they would like to see changed about K-12 mathematics education to align with their views on important skills for success beyond high school, the top five requests across interviews with all stakeholders focused tightly on expanding existing mathematics teacher capacity, filling the teacher production pipeline with qualified teachers, retaining teachers through higher pay and access to high quality instructional materials and providing families with supports to help build mathematical literacy at home.

Recommendation: Build School-Industry Partnerships for Math Success

Leverage School-Industry Partnerships

Student success beyond high school is a responsibility shared by many, including families, teachers, communities, and future employers. Teachers work diligently to ensure students are successful within K-12 classrooms, but as students join the workforce, success takes many forms, spanning a multitude of careers. As business leaders described, there is a real need for students to enter the workforce with a core set of skills that can be tailored to a career of their choosing. Thus, there is an opportunity for businesses to invest in schools (e.g., internships, training opportunities) and partner with teachers so both future employers and teachers understand the needs of the workforce, allowing students to better situate themselves as they seek employment. It is noteworthy that some recent initiatives have sought to provide students with knowledge of career and college opportunities after high school and the kinds of skills required to be successful. Capitalizing on school-industry partnerships to enhance these initiatives could be fruitful.

Invest in Comprehensive Mathematics Teacher Support

Business professionals frequently called for students to be prepared for careers where collaborative work using mathematics to solve novel and complex problems is expected. Not only does this parallel many of the MTRs (FLDOE, 2020) and national guidelines (NRC, 2001), it aligns with national and international studies that show a collaborative learning environment focused on relevant mathematics enhances student engagement and achievement (Mullis et al., 2019; OECD, 2014; 2020; 2024). However, there is a misalignment between these requests and a) what most students experience and b) what educators report their math class is like. Despite this misalignment, teachers and math coaches expressed a shared goal and vision of the math classroom, requesting a consistent need for 1) high quality professional learning on content and how to integrate the MTRs, 2) higher teacher compensation to retain highly qualified math teachers and 3) access to high quality instructional materials for mathematics. Further, technical schools and colleges serve as a bridge between high school and the workforce for many students. There is much to gain from further formalizing these connections through expansion of partnerships to include postsecondary educational experiences.

Invest in Family Resources in Mathematics

A final layer of support that should not be forgotten is to provide parents and caregivers with resources to help their children be mathematically successful. Many parents and caregivers reported that they felt uncomfortable helping their children with homework and talking with the teacher about their child's math learning, and also frequently expressed a frustration with math being taught differently from how they learned it in school. An increase in teacher professional learning on integrating the MTRs in order to meet workforce demands will require support from schools and districts so that parents and caregivers can work with their child(ren) in mutually beneficial ways. Such supports could include math-centered school or community events, math-specific resources for families to use to support at-home learning, and increased communication to establish shared understanding of what math is being taught and how. Another opporunitity would be to inform and educate parents and caregivers about the kinds of college and career opportunities that are available to their student(s) as they plan for their future beyond graduation.

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