Emerging Solutions It Takes a Village: Central Texas Mathematics Alignment Taskforce

Dana Center Mathematics



The University of Texas at Austin Charles A. Dana Center

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Institutions across the country are adopting new policies and practices to better align higher education and high school mathematics pathways to improve student success. Over the past year with support from the Michael & Susan Dell Foundation, the Charles A. Dana Center at The University of Texas at Austin and E3 Alliance have taken up the challenge of redefining regional mathematics pathways in Central Texas so that many thousands more students can demonstrate college readiness in mathematics and succeed in college.

Recognizing that student proficiency and success rates in mathematics are much lower than desired in Central Texas, as is commonly the case elsewhere, the region's education leaders decided in 2018 to address the problem directly and established the Central Texas Math Alignment Taskforce (CTXMAT). Less than two years later, changes are underway in K-12, community colleges, and universities that all expect will lead to greater achievement in mathematics for all of their students. Further, this effort serves as an example for the nation in creating a cohesive regional alignment platform to address equity goals and student success.

This brief shares how CTXMAT used collective impact to work towards improving student outcomes. It describes the task force's goals, process, and initial results, illustrating the value and success of this approach.



The Collaboration

The collective impact strategy brought together cross-sector education leaders to address a problem that no single organization can solve alone. A coalition representing the Dana Center, E3 Alliance, secondary and postsecondary institutions, and contributing organizations such as the Texas Higher Education Coordinating Board (THECB) and the Texas Student Success Council was needed, with each partner providing knowledge and expertise in specific or shared areas.

The Dana Center develops and scales education innovations to support educators, administrators, and policymakers in creating seamless transitions throughout the 9–14 system for all students, especially those who historically have been underserved. The Center has worked in over 32 states, working effectively across K–12 and higher education sectors to provide faculty, staff, administrators, and policy representatives with tools, resources, and services necessary to implement high-quality mathematics pathways. The Dana Center Mathematics Pathways works at the national and state levels and with institutions to implement mathematics pathways aligned with students' career aspirations.

E3 Alliance is a regional, data-driven education collaborative with a mission of "transforming education systems through data and collaboration so all students succeed." Since 2006, E3 has been bringing together education, business, nonprofit, and policy leaders in the Central Texas region to review data to inform efforts to strengthen student progression and outcomes, and to initiate coordinated action.

The educational institutions in this collaboration included 15 independent school districts from rural, suburban, and urban areas in Central Texas; two public and three independent universities; and two community colleges. The Central Texas region serves over 285,000 students in K–12 schools and approximately 125,000 undergraduate students in institutions of higher education (IHEs).

As part of a collective impact initiative, these groups went beyond informal collaborations; rather, they worked cohesively to establish a structured process that led to a shared agenda, close communication, and a plan of action that would benefit all involved. These organizations were committed to ensuring that the following five elements were present: a common agenda, shared measurement systems, mutually reinforcing activities, continuous communication, and backbone support organizations.¹

This "backbone" refers to dedicated organizations with skilled staff who coordinated the effort. In the case of the CTXMAT, the Dana Center and Austin-based E3 Alliance provided this role, guiding the initiative's vision and supporting implementation of this collaborative approach.

Background

In October 2017, Central Texas superintendents were exploring trends and data on high school mathematics course taking in response to Texas House Bill 5 (HB5). The bill had made significant changes to education policy in 2013, including changes to the high school curriculum. Graduation requirements were modified so that students would no longer be required to take four years of mathematics, nor was Algebra II required. High schools had to begin offering career-oriented "endorsement" pathways to help students explore career options, and some of these pathways included four years of mathematics and Algebra II, but not all. HB5 also required that districts offer a transition mathematics course for 12th-grade students who have not yet met college readiness standards. The transition course must be implemented in partnership with at least one IHE.

Based on this legislative change and in light of research findings from the most recent "Math Matters" outcomes from E3 Alliance, the superintendents were eager to learn ways to offer students a rigorous, four-year mathematics sequence that did not present the same constraints as the previous "4x4" policy and that also aligned with the needs of regional higher education partners to support student success. At the same time, superintendents expressed frustration that IHEs were not supporting aligned mathematics courses with appropriate options for students in different fields of study.



In response to this interest, E3 Alliance invited the Dana Center to cofacilitate a meeting in May 2018, where institutional and mathematics leadership from the regional IHEs joined district superintendents and staff. This meeting presented an overview of recent changes in entry-level college mathematics course options and the mathematics pathways movement, and provided status updates on mathematics pathways implementation and admissions policies and practices in Central Texas.

Based on these findings and other research explored by district and higher education partners in prior E3 meetings, the group surfaced implications for high school mathematics in Central Texas and defined actions needed to improve student success and college readiness in high school mathematics. This gathering was important in establishing that the changes needed to improve mathematics achievement in the region had to be undertaken jointly by the school districts and higher education.

As one of the district-level participants described it,

E3 pulled together superintendents and college presidents as a way to start bridging that gap between higher ed and K-12... Huge disconnect [with] admissions, college curriculum, and K-12 not being on the same page. We're not really talking the same language. We've all identified that we have a problem, but we're not doing much about it. We're still mostly looking out for ourselves. Kids in the community are suffering. E3 had the data and said, "Look at this problem. If we want to address this, do we have your support?" The superintendents and presidents and provosts said, "Yes. We'll provide our resources—our people—to work on this."

The superintendents and higher education presidents appointed the Central Texas Mathematics Alignment Taskforce (CTXMAT) to analyze course offerings and alignment opportunities, consolidate recommendations, and present actionable solutions. Specifically, the CTXMAT was given the following charge from five college presidents and eight district superintendents representing education leadership across the region:

- 1. Examine and document the current alignment of high school mathematics content—especially those taught in the later years of high school—with that of gateway college mathematics courses.
- 2. Recommend actions that will result in better alignment of high school mathematics course-taking options with the requirements of collegiate programs of study and the expectations of employers, recognizing opportunities to leverage new, more targeted mathematics pathways.
- 3. Recommend strategies to address equity gaps that persist in readiness for college mathematics, including data-gathering and evaluation strategies.

A Common Agenda Driven by Shared Data

The first step in enacting any significant change within a community was to set common goals. Creating a shared vision for change involves first providing necessary information to stakeholders. The foundation of the Dana Center's and E3 Alliance's work is the belief that data can and should motivate change. As objective data are shared, laying bare where students are not succeeding and where inequities exist, community leaders can begin to set objectives for improvement and work together to achieve them.

Based on its data analysis of disappointing student outcomes in mathematics course completion, the Dana Center began the work in reforming undergraduate mathematics education in Texas in 2013. As of 2018, 100% of colleges and universities in Texas offer multiple mathematics courses to meet the mathematics requirements for degree completion. Students' completion rates of college-level mathematics courses have improved by 35% at Texas community colleges.

E3's attention to broadly improving education from pre–K through high school has long included an emphasis on mathematics. The organization's analyses of data from the Texas Education Research Center Data Repository—a state longitudinal data system that draws from multiple data sets, including those of the Texas Education Agency, the Texas Higher Education Coordinating Board, and the Texas Workforce Commission—showed that mathematics was a stumbling block for students all the way through elementary and secondary schooling.

Based on these analyses, the CTXMAT established the following goals:

• Refine local criteria defining what constitutes college readiness in mathematics content and student success skills, with consideration of relevance to students' programs of study and career aspirations;

- Ensure high school mathematics course offerings and advising practices reflect multiple mathematics pathways to student success;
- Develop and act upon district-level policies, priorities, and practices which increase the percentage of students who are college ready in mathematics and who complete coursework aligned with their college aspirations; and
- Align high school and college mathematics courses and expectations based on the academic and career goals of students so that many more students are successful in and through higher education.

Two individuals were appointed—one from a school district and one from a community college—to co-lead the task force in analyzing course offerings and alignment opportunities across high schools, colleges, and universities; determining recommendations; and presenting actionable solutions. These co-chairs, along with 10 other school district and IHE faculty and administrators, volunteered countless hours into the CTXMAT. The investment of time by local faculty leaders and the support of local senior educational leaders provided the foundation, planning, and initial implementation of the activities to accomplish the abovementioned goals.

Throughout the following months, as the Dana Center and E3 Alliance facilitated the task force and subcommittee meetings, participants were continuously confronted with data. In some cases, E3 provided packets of data for each school district, for example, showing mathematics equity gaps in those districts compared to regionally— a "no-excuses packet," as one participant called it. The Dana Center shared packets of data with IHEs on actual course sections and student enrollment in mathematics courses to highlight misalignment of mathematics courses with programs of study. In other cases, participant districts and colleges were asked to pull particular data points to bring to the convenings. A participant shared an example:

We had to gather from our institutions what the actual course-taking percentages were. How many ACC students in a given semester took College Algebra versus other courses. A snapshot. For K-12, they did the same. That, for a lot of us, was incredibly eye-opening. In some of the colleges, almost all students took College Algebra. Didn't know that. And seeing what they were doing in K-12... very eye-opening. Put them up all along the wall and we could really see the differences. I was surprised at how much College Algebra we still have since we've been working really hard on math pathways.

Reviewing data helped to engage and motivate participants. A task force co-lead said,

E3 is able to get a diverse group of people to the table. The community, workforce, K–12, higher ed. Getting us all to the table is what E3 is really good at. And they do it by showing you the data. The data they put together is really good, it's really local. You see yourself in the data—"Wow, that's us." It's high-quality, it's well put-together. It draws you in.



Mutually Reinforcing Activities

Once data-informed goals were established, stakeholders were able to begin their differentiated but coordinated work. They were expected to contribute according to their own strengths and expertise, ensuring that activities were mutually reinforcing in support of the goals.

This key characteristic of the collective impact approach is clearly seen in the cross-sector CTXMAT. Individuals with diverse roles across the different participating education institutions were tasked to collaborate to address specific issues that, in combination, would move the entire effort forward. They understood their crucial role in the effort. One participant pointed out,

We can't just ask other people to do a bunch of things. We'll have better selling if we contribute as well, if we do things differently on our level as well.

Together, task force members began to identify some key issues, which they then organized into larger themes that became the basis of three subcommittees: alignment, policy, and teaching and learning; the latter group decided to also address non-cognitive and student success skills. The goal of each subcommittee was to develop a set of recommendations, which would be shared with the entire task force and the education leaders. Each group held approximately six meetings over the course of a year. The Dana Center and E3 Alliance provided facilitation, data, and research support.

The Dana Center collected and shared data with the alignment subcommittee on multiple aspects of college mathematics pathways and courses, so that the participants from higher education could more clearly see their own recent efforts and challenges. Faculty in partner disciplines identified the mathematical knowledge and skills that students in their majors needed to know. These faculty from institutions across the region expressed clear consensus on which mathematics course best prepares students for success in the identified career field. Several of the participating colleges and universities were already strongly engaged in establishing new mathematics pathways, such as statistics for certain majors, but they could see that more work needed to be done, such as ensuring that course catalogues represent the most up-to-date course offerings and the new revelations based on information from partner discipline faculty.

District personnel gained an awareness of the variation in course requirements across the higher education institutions as well as of the ongoing changes in higher education:

And understanding what's happening at the four-year institutions, we didn't realize how different the requirements are and what's driving that. Requirements for a major: one school would require, for example, say like history, you have to take College Algebra; another college says, you can take quantitative reasoning. And if students don't know where they're going to transfer, huge difference between UT Austin—don't even have College Algebra, they have quant reasoning or stats or pre-calc. Two other universities down the road wanted College Algebra for everything. . . . Every school has different reasons for what they're doing. It was rewarding to start to see alignment of requirements across institutions during this process.

Given changes to mathematics requirements and pathways in higher education and efforts to bring K–12 mathematics offerings in line, the policy subcommittee identified the statewide college readiness examination— the algebra-focused TSI-A—as a stumbling block for students. Since the assessment is administered by the Texas Higher Education Coordinating Board, the policy-focused group strategized about how to push the agency towards revising the examination to better reflect the region's—and state's—new direction in mathematics, specifically to better assess students for their proficiency in statistics and quantitative reasoning. The policy



Dr. Clayton Johnston, dean of UT Dell Medical School, addresses the group with panelists Uri Treisman (Dana Center), Ali Khataw (Encotech Engineering), Debbie Hiott (KUT Austin, NPR affiliate), and Susan Dawson (E3 Alliance).

subcommittee also shared the research showing that using multiple measures to determine college readiness and college course placement, rather than a standardized test alone, results in higher student success.

The teaching and learning subcommittee included college mathematics faculty and district mathematics curriculum specialists. As one participant said, "We just started talking . . . and hit on a few things pretty quickly." Dana Center staff working with the group observed,

Hearing some common challenges that high school and college mathematics educators face helped the group target some really important areas to focus on—specifically problem solving and communication.

A major revelation was that high school students are accustomed primarily to multiple-choice assessments, yet college faculty emphasize open-ended responses that require students to show their work. The subcommittee decided to develop multi-part, open-ended performance tasks for five different high school mathematics courses, along with a rubric for students to use to reflect on their own problem-solving processes. These tasks were later shared with the entire task force and with other regional mathematics educators via professional development sessions.

These are just a few examples of the topics that the subcommittees explored, examined, and addressed. The fact that the groups represented diverse institutions in different sectors helped all to see the gaps in their own knowledge about their region's education pipeline:

It was great to see high school teachers hearing about active engagement in college math courses and the need for students to be able to talk about the mathematics they are learning. Often, high school faculty abandon active engagement strategies because they mistakenly believe that colleges don't value them. It was a real eye-opener for them to see that these highyield teaching practices are used in higher education classrooms.

These holes in the educators' understanding had to be filled so that they could address those of their students. As one Dana Center staffer observed,

Having these educators working together to produce rich tasks for students proved to be an important step in aligning the expectations we have of our students as they transition from high school to postsecondary education; however, this work has to continue. The conversations between college and high school math educators around math tasks and quality instruction were great, but not sufficient. We need to continue to build deep collaborations between K-12 and higher education to build a true sense of shared ownership for our students.

Continuous Communication

Collective impact efforts are successful when there is continuous communication, which establishes trust among the participants and builds a common will to drive change. The partners' consistent and long-term communication demonstrated this essential component of the collective impact approach. While they appreciated that their day-to-day interests seemed different, all partners knew they shared a strong commitment to improve outcomes for all students—not just for the students in their own institutions.

In many meetings over the course of 18 months, E3 Alliance and the Dana Center brought members of subcommittees together in different combinations to review data, identify both barriers and drivers to student success in mathematics, and establish steps to make changes. Participants complimented the way both organizations structured the meetings for maximum collaboration and productivity.

By several accounts, the positive reputation and skilled facilitation of E3, as well as the continued focus on objective data, helped to foster trusting relationships. A college president noted,

E3 is good at convening without threatening or intimidating or making anybody feel guilty. A convening where people know that there's an issue to deal with and how do we all—everybody —roll up our sleeves and address the problem. And the data are the data. In a non-finger-pointing atmosphere where people feel like what they do and say and the conversation is protected. So, nobody's going to be embarrassed.

According to another participant,

It was really exciting. It really increased the communication between all of us. As a higher ed person who's never taught in K-12, I had no idea what goes on there. You're like, they're not preparing our students. Everybody blames everybody else. There were a lot of things I found out that were really good. The more you meet other people, understand what they're experiencing, the most you can come up with solutions that help other people. Then it's not one-sided. Bringing in different perspectives gives you a different take on what the problem actually is.

With increasing trust, steady communication, and momentum, the subcommittees continued to meet frequently. The initiative's aggressive timeline yielded an emerging consensus on recommendations during summer 2019. In September, the CTXMAT presented a draft of its four primary recommendations, with action items for each, to 75 Central Texas education leaders, including higher education presidents, provosts, mathematics chairs,



and admissions directors; PK–12 district superintendents, curriculum and instruction leads, and mathematics directors; and key influencers in the region.

With feedback incorporated from that group of leaders, in October 2018, E3 Alliance and the Dana Center convened the initial group of presidents and superintendents to ask for their endorsement of the final versions of the recommendations. Following their positive response, a summit was held November 1, 2019, with over 120 participants, including representatives from 15 school districts, six institutions of higher education, the Texas Higher Education Coordinating Board, Texas Workforce Commission, Texas Education Agency, and philanthropic organizations, along with the Dana Center and E3 leads. The summit deepened the cohesion and reinforced the commitment among those who had worked for many months on the recommendations. The summit also provided the opportunity to broaden participation in the initiative by including additional education professionals such as guidance and counseling staff.

The Backbone

An important component of facilitating collective impact is having one or more organizations to guide the vision and strategy, support aligned activities, establish and report shared measures, build public will, advance policy, and mobilize funding.² E3 Alliance and the Dana Center served as the backbone of this initiative, bringing together cross-sector actors to mend and strengthen fragmented systems.

A participant noted,

E3 is cross-sector, Dana Center is cross-sector. This is the most I've ever experienced accomplishing in such a short amount of time. It was the combination of E3 and the Dana Center. They bring different skill sets into it; they have a lot of power with a lot of people.



In steering the CTXMAT, the Dana Center and E3 fulfilled all of these responsibilities. The initial vision—to transform mathematics alignment, instruction, and policy through the CTXMAT—was launched during meetings convened by E3, and the subcommittee work was informed and driven at a rapid pace by both E3 Alliance and the Dana Center. These two organizations deftly fostered an environment where individuals with different roles and obligations for different parts of the education pipeline could understand one another's points of view and work together with confidence. In addition, both organizations collaborated on a proposal with the Dana Center, securing funding for these efforts from the Michael & Susan Dell Foundation.

The president of E3 Alliance is well aware of the various skills and resources of her organization to put the necessary elements into place for collective impact:

We talk all the time about how we're trying to create massive system change with no authority over anyone to do anything. We have to have the best data, have to have the relationships. People have to trust us and want to work with us.

As some participants pointed out, E3 and the Dana Center have somewhat different strengths that, together, served the initiative very well—better than either organization could have done individually. A participant shared,

My sense is that they're playing to the strengths that they have. Susan and team have really focused on the K–12 piece of the work in bringing those folks to the table. The Dana Center has

more focus on postsecondary.... All the folks I've talked with on both teams seem to be deeply knowledgeable about what's going on. They know what's been tried before, what doesn't work, and what works.... I think they've done a good job at co-facilitation of meetings.... Dana was more the math content expert, E3 more of a data miner and facilitator.... They were so smart from the beginning to be both practical and to also have an eye on policy and to be driving them both at the same time. Because they will have a greater impact together.

Others spoke of E3 Alliance's "clout" with and respect from the community and its leaders, which complemented the Dana Center's more national and statewide perspective from its similar work in 32 other states, including strong work in Texas. The Dana Center's expertise in systemic transformation for mathematics policy and practice brought a new level of information to this regional initiative. Misalignment of mathematics and equity gaps in mathematics outcomes are not unique to Central Texas. As a participant said,

I would love to see them finish what they said they aimed to do. . . . Let them complete that and be a demonstration to the rest of the state.

The Results

The Central Texas Math Summit brought together over 120 participants to learn about the progress made by the CTXMAT. The convening celebrated and shared the first phase of the task force's work and kicked off the next phase of implementation for the regional mathematics alignment efforts. The agenda included time for districts and institutions to identify specific actions they will take in the coming year—specifically within 30, 60, and 90 days—to continue to advance. As one participant described it,

Being there that day just blew me away, with over a hundred people in the room, leaders from districts, universities, colleges. Not everyone was at the same place, but people were making their way across the spectrum of what they have to do. The agenda was very well laid out; it had something for everyone. People showed up, they were there early. That says a lot that they were willing to take an entire day to spend time on this, teachers and deans and presidents alike.

Summit participants shared some of the results seen thus far:

One is better understanding, better articulation, better communication. What are the correct mathematical pathways? Who has that understanding and that knowledge and who doesn't? And how do we make sure that we scale that understanding? Making sure that we have the right alignment all the way up. And the right articulation between things like our areas of study and the university's majors. And the endorsements at the K–12 level.

Coming together to create an action plan for our district to reach more students and keep them in math for 4 years in high school.

A lot of people are really excited and would want to continue if possible.... There is a huge amount of potential.

According to feedback gathered after the convening, many participants would like to have additional time for these efforts. They valued the opportunity to collaborate with their own team as well as with others with whom they do not normally meet. Participants appreciated the "time to work together as a district" as well as "hearing from other institutions."

This Central Texas collective impact initiative demonstrates how communities can be united to make changes at scale to improve student outcomes. E3 Alliance's local convening power and communication framework, coupled with the Dana Center's national and statewide reputation, ability to work with faculty and IHE leaders, and mathematics expertise, built a strong backbone. Both organizations' facility with and focus on data, and their facilitation skills, moved a large group of educators and education leaders forward in better aligning mathematics content and instruction. Such cross-sector collaboration is not common, but these efforts show the great potential for impact when this type of collaboration is achieved.

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Endnotes

¹Kania, J., & Kramer, M. (2011). Collective impact. *Stanford Social Innovation Review*. https://ssir.org/articles/entry/collective_impact

² Turner, S., Merchant, K., Kania, J., & Martin, E. (2012, July 18). Understanding the value of backbone organizations in collective impact: Part 2. *Stanford Social Innovation Review*. https://ssir.org/articles/entry/understanding_the_value_of_backbone_organizations_in_collective_impact_2#

About this resource

Authors:	Reviewer:
Dr. Katherine L. Hughes, Principal, EdWordian, LLC	Lindsay Fitzpatrick, Cross-Team Lead, Transition
Dr. Martha Ellis, Interim Managing Director, Charles A. Dana Center	Initiatives, Charles A. Dana Center
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