

MODERNIZING MATHEMATICS PATHWAYS

AT TEXAS UNIVERSITIES



Insights from the Dana Center Mathematics
Pathways Transfer Champions

EXECUTIVE SUMMARY

For decades, the traditional algebra- and calculus-based mathematics sequences were regarded as the best route for almost all two- and four-year students, regardless of their majors. Today, that is no longer the case. College mathematics requirements are changing in response to the evolving needs of students, the economy, and society at large. Enrollments in statistics and quantitative reasoning courses are on the rise, while enrollments in college algebra are declining on many campuses.

Texas is a national leader in developing multiple pathways that connect with students' programs of study. Many Texas universities already established modern mathematics pathways that are aligned to different programs of study: statistics for students in the social sciences and health fields; quantitative reasoning for students in the liberal arts and fine arts; and the calculus preparation sequence for students in STEM majors. This work parallels the efforts of

the state's 50 community colleges that, through the Dana Center Mathematics Pathways, implement multiple mathematics pathways beginning at the developmental level.

Modernizing Mathematics Pathways at Texas Universities: Insights from the New Mathways Project Transfer Champions describes the evolution of multiple mathematics pathways and the change process of seven pioneering universities. The study aims to help other institutions in Texas and nationally that are planning to modernize their mathematics programs by offering multiple pathways. Informed by interviews with deans, department heads, and faculty representatives, the study presents implementation advice for other four-year institutions and their community college partners in ways that enhance system coherence and ease student transfer.



RECOMMENDATIONS

FOR EFFECTIVE MULTIPLE MATHEMATICS PATHWAYS IMPLEMENTATION

Implementing multiple mathematics pathways requires attention to both supply and demand — the supply of robust, high-quality mathematics offerings, and students' demand for those options and alternatives, particularly from students pursuing majors that do not require algebraically-intensive courses. The following recommendations, distilled from the experience of these institutions, offer action steps for institutions planning to develop multiple pathways and for those where implementation is underway but not yet scaled.

Define the problem

so that the case for collective action is clear.

Change leaders can create a clear problem definition; leverage data; communicate with faculty in math and partner disciplines; understand institutional context regarding course success and alignment of math pathways to programs of study.

Engage faculty and administrators across math and other departments.

Engage math faculty and department leadership in assessing current math courses; build broad coalition of support and articulate benefits of multiple pathways; determine whether to develop new courses and/or work with partner disciplines to refine existing courses to meet student needs.

Involve advisors

so that students get the right messages.

Advisors can drive student success by communicating that appropriate mathematics pathways increase the likelihood of completion — saving time and money — and by guiding students to appropriate math pathways. Orient advisors to the benefits of math pathways; develop processes and policies that support first-year students and undeclared majors.

Ensure new math pathways are transferable and specify math requirements for each major.

Articulate clear transfer policies with partner institutions; communicate regularly about which programs should or should not use college algebra; use common course numbers to simplify communication; create program maps for students and advisors outlining math pathways, course sequences, and requirements for majors.

Situate math pathways in a broader redesign of credential programs.

Embed math pathways in efforts to redesign developmental education and programs of study; implement strategies to support completion; accelerate student choices about programs, courses, and careers through intrusive advising and program mapping.

Communicate regularly with transfer partners so they understand program requirements and know their university colleagues.

Coordinate math requirements for majors with other institutions; encourage faculty to compare course materials; support regional alignment of math pathways by hosting workshops; adopt regional memoranda of understanding; provide advisors with accurate information about transfer and applicability of math courses.

Compare school requirements and policies with those of other institutions in the state.

Compare your institution's progress with peers to accelerate consensus, plans, and implementation and to secure support from state actors; use Dana Center and Texas Higher Education Coordinating Board resources; align math requirements for particular majors; address transfer issues; share practices and policies.

The full report is available at <https://dcmathpathways.org/resources/modernizing-mathematics-pathways-texas-universities-full-report>

