EXECUTIVE SUMMARY

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Exploring Equity in Students' Postsecondary Math Pathway Choices

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Higher education institutions in California and across the country are transforming their approach to math education to ensure that it supports student success and equity. Colleges and universities are adopting new evidence-based strategies including multiple measures placement, diversified mathematics pathways, and just-in-time supports such as corequisite courses. These reforms are expected to improve equity in outcomes by eliminating barriers that arbitrarily prevent students from successfully completing college and disproportionately impact low-income students and students of color.

To shed light on the strategies' effectiveness in improving equity, it is important to understand how students "figure out" which mathematics courses to take—and the structures that support or hinder them in making appropriate and aspirational choices. A particular concern with diversifying math pathways has been whether the new pathway options, such as statistics, afford the same opportunities as do the traditional STEM pathways—and whether students have authentic access to a range of pathways.

This exploratory study examines the early implementation of new policies within California community colleges and the California State University. Under both systems' new policies, students play a primary role in placing themselves into math courses, often with support from counselors or faculty. To explore whether early implementation of these policies was encouraging and promoting aspirational math pathway selections, the study paid primary attention to three areas: (1) the type of information and guidance provided to students, (2) the degree of agency students experienced, and (3) the range of intentional strategies employed to help students be successful in their math pathways.

Findings. Key findings include:

- Because of experiences with inconsistent or inaccurate information, students triangulate information to decide which courses to take and with which instructors.
- Since math pathways are intended to align with students' fields of study, counseling is more effective, and information is better received, if a student has selected a major or area of interest. Undecided students could benefit from additional counseling support that offers major and career exploration.
- The elimination of placement testing removes the specific risks associated with tests, but

first-generation students or students with lower math confidence may not make optimal choices under self-placement mechanisms, suggesting the need for improved communication about options as well as other safeguards.

- Students recognize and appreciate colleges' efforts to expand structured and proactive support and instructional strategies—such as corequisites and support courses—to ensure more students have needed math support.
- A safe and empowering classroom environment that builds students' confidence and mastery is critical, and students tend to prefer faculty who are known as supportive.

Recommendations. Preliminary recommendations suggested by the experiences of administrators and students in this study could be confirmed and refined by future research.

Among these recommendations, colleges should consider:

- Offering more professional development resources for counselors to ensure their familiarity with math pathways as they align to particular majors or meta-majors
- Providing extended counseling appointments for initial educational planning, especially for students who are undecided between STEM and non-STEM fields
- Eliminating structural barriers that can lead students to make suboptimal choices of math pathway
- Ensuring ongoing engagement and professional development for math faculty to develop student-centered classroom environments that promote math mastery while reducing math anxiety
- Creating structures that encourage, promote, and develop support across departments and functions to ensure an accurate and seamless process for students to access needed math support

Conclusions. Two areas where the placement process risks undermining equity are misinformation and self-placement.

Misinformation, regardless of the source, can promote inequities, depending on students' knowledge and use of resources to make math pathway selections. And although the self-placement process attempts to remove biases and opportunities for misguidance, it may need to be designed more explicitly to address math anxiety since negative math experiences can lead some students to unnecessarily elect lower-level courses or avoid STEM options.

Though the focus of this study is the course placement and selection process, other structural changes are called for, such as (1) ensuring that the variety and availability of math course offerings match the range of student interests, (2) eliminating all or most remedial courses so that lack of information or lack of agency doesn't cause students to needlessly enroll in them, and (3) offering options, such as corequisite courses, for students who develop an interest in a STEM field after taking Statistics or another non-STEM math courses.

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