The University of Texas at Austin
Charles A. Dana Center

The HB 5 College Prep Math Course—Challenges and Opportunities

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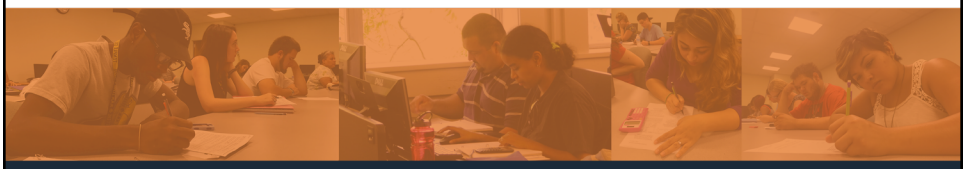

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About the Dana Center

Equity — Access — Excellence

Dana Center by the Numbers

We supported 60,500 K-12 students attending school on U.S. military bases through our work with the **U.S. Department of Defense Education Activity**.

Dana Center by the Numbers

By the close of 2017, the Dana Center had contributed to the **implementation of math pathways** in higher education systems, institutions, and campuses in 29 states.

Dana Center by the Numbers

We engaged with 118 districts in 23 states to provide middle and high school math courses of the **highest quality**, as recognized by rigorous national and state reviews, including EdReports.org, Louisiana Department of Education, and Texas Education Agency panels.

Agenda

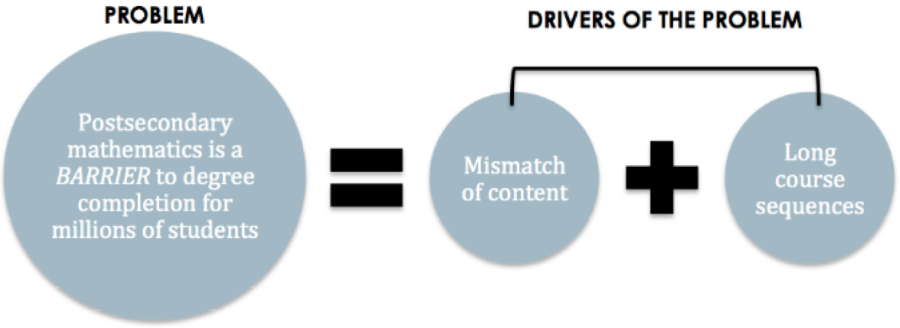
- Dimensions of college readiness
- Naming barriers
- Trends in higher education
- Investigating multiple pathways

Building momentum

- Academic knowledge and skills
- Noncognitive skills
- College cultural capital

Building Student Momentum From High School Into College, Jobs for the Future, February 2016

Drivers that create barriers for students in college



A growing body of evidence identifies traditional postsecondary mathematics as a primary barrier to degree completion and equitable outcomes for millions of students.

Charles A. Dana Center. (2016). *DCMP Call to action: The case for mathematics pathways.* Austin, TX: Author. *https://dcmathpathways.org/sites/default/files/resources/2016-11/The Case for Mathematics Pathways.pdf*

"College ready" for what (math)?

College Algebra?

- **College Algebra was originally intended to prepare students for calculus.**

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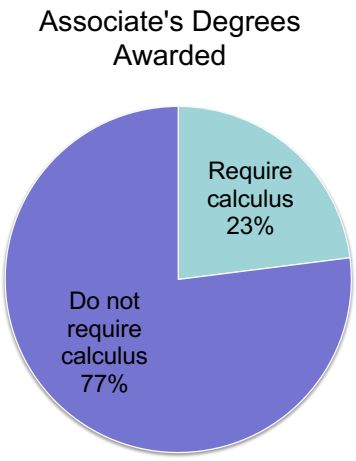
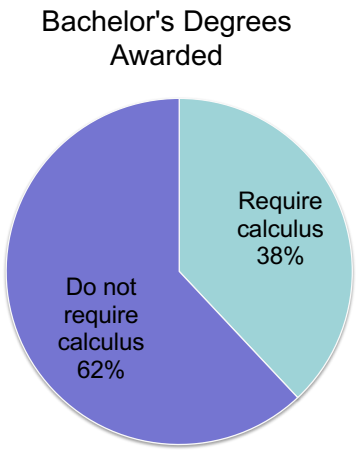
Math requirements





Calculations based on THECB data, 2013 Degrees Earned by CIP Code.

College Algebra?

- College Algebra was originally intended to prepare students for calculus.
- In 2004, the Mathematical Association of America (MAA) called for the end of using College Algebra as a terminal mathematics course, citing a serious mismatch between the original rationale for College Algebra and the mathematical needs of students who take the course.

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The move to mathematics pathways

- In 2015, the MAA, along with four major mathematical professional associations, called for multiple mathematics pathways that are aligned to fields of study.
- Some colleges and universities have begun to respond by implementing math pathways, such as quantitative reasoning, statistics, technical mathematics (for certificate programs), and a redesigned algebraic-intensive/or Calculus pathway.

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An overview of the course

Unit 1

- **Lesson 1: Building the foundations for our success**
  - Building the foundations for our success – *Student success focus*
- **Lesson 2: Getting started**
  - How big is a billion -- *Quantitative reasoning, large numbers*
  - Building a learning community -- *Student success focus*
  - How big is a billion (cont.) -- *Quantitative reasoning, large numbers*
  - Building a learning community (cont.) -- *Student success focus*
- **Lesson 3: Working In groups and Creating success teams**
  - Working in groups – *Student success focus*
  - Creating success teams– *Student success focus*
- **Lesson 4: Ratios and numbers**

Looking at multiple pathways

- **What do you notice?**
- **What excites you?**
- **What do you have questions about?**

Evaluation of model course implementation

2016-17 and 2017-18 academic years

- Survey to detect changes in students' learning mindsets and strategies
- Data on students' attainment of college-readiness status
- (Future) Data on students' enrollment in and completion of their first college-level mathematics course

"Noncognitive" factors measured on student survey

- Engagement
- Help-Seeking with Peers
- Help-Seeking with Teacher
- Theories of Intelligence
- Perceived Instrumentality
- Self-Efficacy

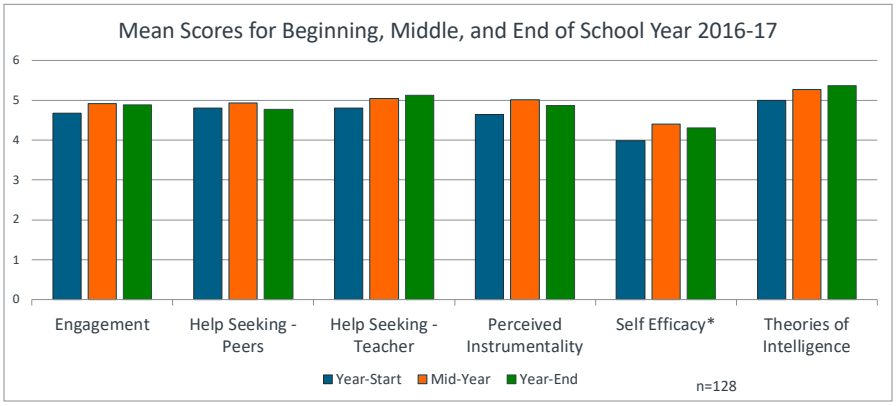
"Noncognitive" factors measured on student survey

- **Engagement – Higher scores on this variable indicate that students participate more in general, put forth more effort to do the work, and plan and regulate their efforts more when solving problems.**
- **Help-Seeking with Peers – Higher scores on this measure indicate that students do more to seek help from their peers in the class.**
- **Help-Seeking with Teacher – Higher scores on this measure indicate that students do more to seek help from the teacher in class.**

"Noncognitive" factors measured on student survey

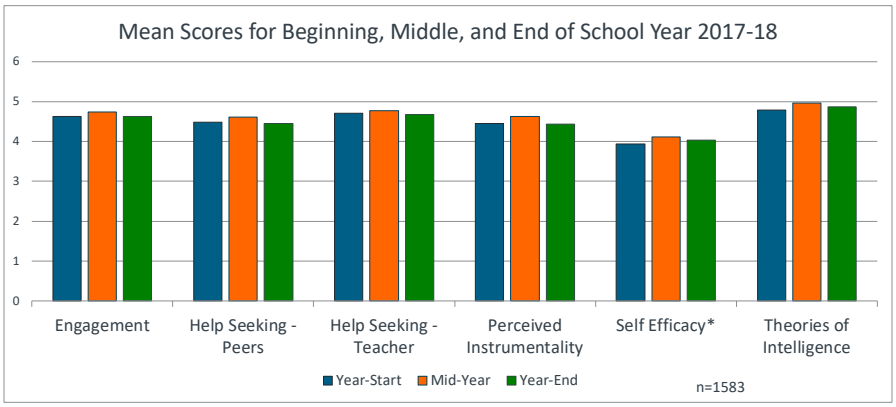
- **Theories of Intelligence – Higher scores on this measure indicate more of a growth mindset (the belief that one can increase his or her own intelligence through effort) whereas lower scores indicate more of a fixed mindset (the belief that one's intelligence is fixed and unchangeable).**
- **Perceived Instrumentality – Higher scores on this measure indicate greater degrees of belief that one will take the information learned in class and use it in the future.**
- **Self-Efficacy – Higher scores on this measure indicate greater degrees of belief that one is capable of learning the material and doing the work of the class.**

Preliminary Findings

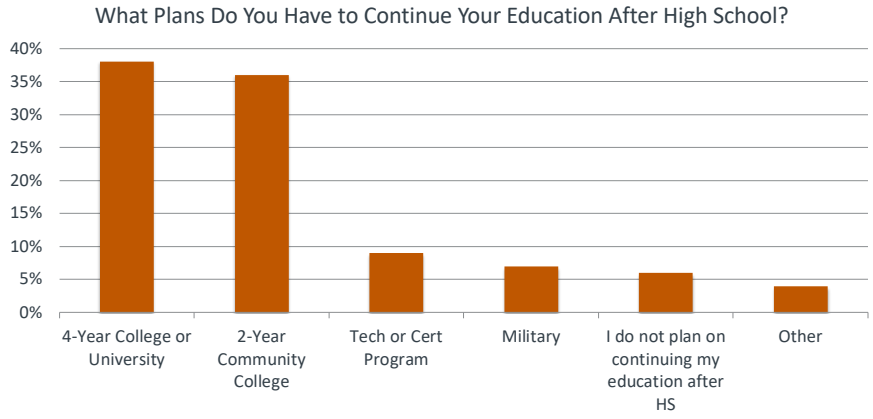


- Student scores indicated a statistically significant increase on all measures from beginning to mid-year
- From mid-year to end-of-year, the only statistically significant change was on *Perceived Instrumentality*

Preliminary Findings

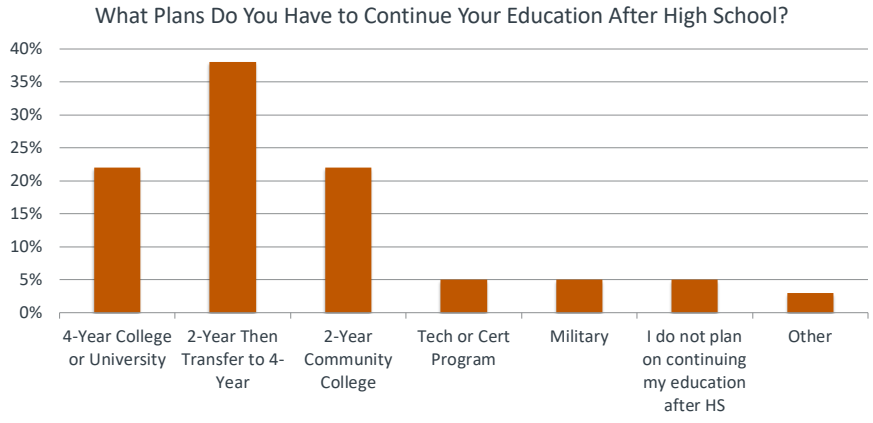


Other measures (2016-17)



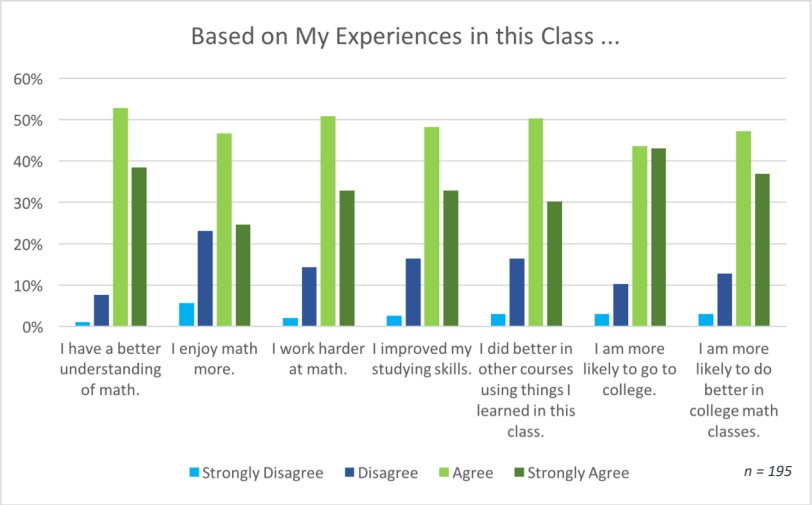
n = 195

Other measures (2017-18)



n = 1469

Other measures (2016-17)



Student voices

- "This class has helped me learn how to think and put a plan into action before giving [up] or saying I can't do something."
- "I've been able to interact and by interacting I learn new strategies and things I've never learned before that make processes simpler and more understandable."
- "It has showed me problem solving skills and has convinced me that I can get smarter."
- "I've learned real world math that I know I will use in the future."
- "It has taught me that I am smarter than I thought."

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