

Addressing the Crisis in Developmental Mathematics and College Readiness

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THE
New Mathways
PROJECT

an initiative of the Charles A. Dana Center and the
Texas Association of Community Colleges

Today's Goals

- Present data about student success in the transition from high school to college.
- Share information about the New Mathways Project and other Dana Center work to improve student success.



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The Problem

"Developmental math is a burial ground for the aspirations of myriad students."
-- Uri Treisman

In mathematical terms, it is a problem of both input and output.

Input: Too many students not "college ready"

National data: 59 -- 67% of community college students are referred to one or more developmental math courses.

In 2011-2012, there were 8.3 million students enrolled in public 2-year colleges, approximately 46% of all undergraduates in the country.

In Texas, 44% of community college students are placed into developmental mathematics.

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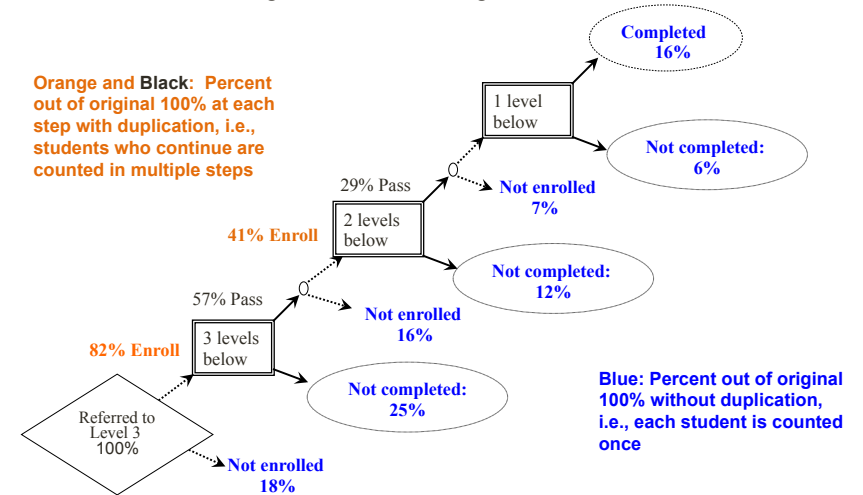
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Output: Too few students earn college credit

- Developmental course sequences are long.
- Individual course success rates are often very low: for both developmental and gateway mathematics courses.
- Students get lost at the transition points.

An illustration of the progression

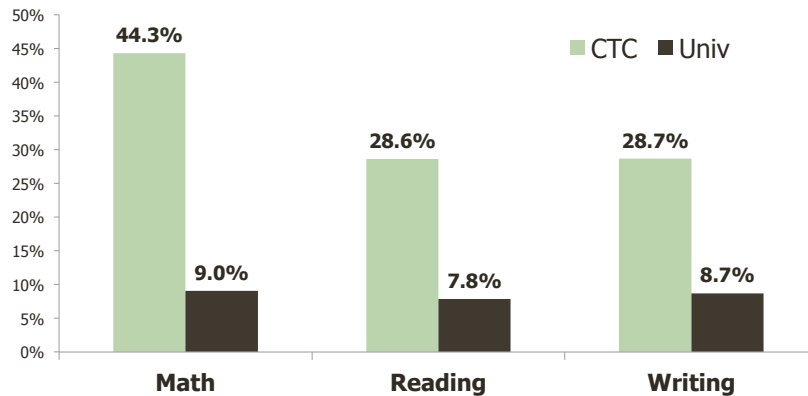
Data from 35 Achieving the Dream Colleges, 2009



Source: Jobs for the Future, Community College Research Center

Math is a particular challenge

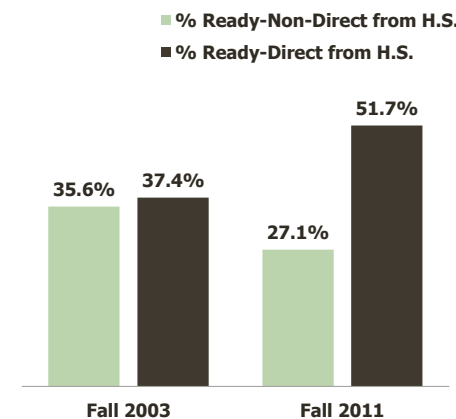
Percentage of Non-College Ready by Subject
Fall 2011 First-Time in College Students



Source: Texas Higher Education Coordinating Board

The good news and the bad news in Texas

Percentage of College Ready Students Entering Community and Technical College in Texas



Source: Texas Higher Education Coordinating Board

How should college readiness be defined?

We advocate for:

College readiness should be determined by the likelihood a student will be able to earn college credit in a gateway course.

Three gateway mathematics courses

- College Algebra (or Pre-Calculus)
- Statistics
- Math for Liberal Arts → Quantitative Reasoning

Three gateway mathematics courses

Traditional developmental mathematics sequence is designed solely to lead to College Algebra.

Placement tests are designed to place students into a traditional, manipulation-focused algebra sequence.

Is College Algebra the “gold standard”?

Growing call from business and education leaders to teach more data analysis and quantitative reasoning.

“Unfortunately, there is often a serious mismatch between the original rationale for a college algebra requirement and the actual needs of the students who take the course.”

-- Mathematical Association of America Committee on Undergraduate Programs in Mathematics (CUPM) 2004 Curriculum Guide

The Dana Center advocates for...

Reforming developmental and gateway mathematics based on four fundamental principles:

1. Multiple pathways with relevant and challenging mathematics content aligned to specific fields of study
2. Acceleration that allows students to complete a college-level math course more quickly
3. Intentional use of strategies to help students develop skills as learners
4. Curriculum design and pedagogy based on proven practice

The New Mathways Project (NMP)

Working in Texas with the Texas Association of Community Colleges (TACC)

- All 50 community colleges districts in the state contributing to development costs
- 47 of the 50 actively engaged with the Dana Center to examine and re-envision programs

Work outside of Texas will start in the fall of 2014.

The NMP at multiple levels

State:

- Policy

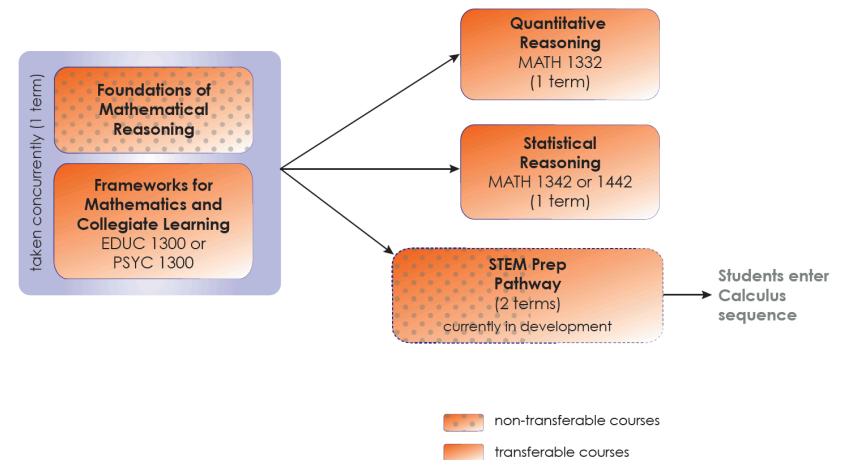
Institutional:

- Implementation support with tools and services

Classroom:

- Faculty training
- Curricular materials

The NMP Courses



Timeline for Development and Implementation

Courses	First Implementation	Publicly Available
Frameworks for Mathematics and Collegiate Learning*	Spring 2013	Fall 2013
Foundations of Mathematical Reasoning	Fall 2013	Fall 2014
Statistical Reasoning	Spring 2014	Spring 2015
Quantitative Reasoning	Spring 2015	Spring 2015
STEM-Prep and bridge course	Spring 2016	Spring 2017

*A PDF version of the Frameworks course is available for open use.

Back to the input...

Dana Center's future steps to increase number of students leaving high school college ready...

Develop 4th year course options that are rigorous alternatives to Pre-Calculus and current "remedial" courses that

- Engage students in relevant, challenging mathematics.
- Build upon what we know about how to support learning.
- Consider both college-ready/non-college ready options.

Bridges not shut doors...

As differentiated pathways become available, we must also...

- Ensure that students are advised into pathways based on their individual needs and strengths.
- Ensure that students have viable bridges that allow them to change pathways if their interests or ambitions change.

A need for a national discussion...

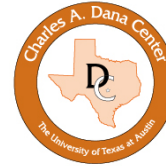
Think about how we define "college readiness" for mathematics:

- What are the core competencies for different pathways?
- How can we assess those competencies, especially to go beyond manipulation skills?
- How should we account for non-cognitive factors that affect a student's chances for success?
- Explore ways to "certify" students are college-ready at the high school level.

Contact Information

- General information about the Dana Center:
www.utdanacenter.org
- Higher Education work:
www.utdanacenter.org/higher-education/
- To receive monthly updates about the NMP, contact us at: mathways@austin.utexas.edu
- Amy Getz (general project issues):
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About the Dana Center



The **Charles A. Dana Center** at The University of Texas at Austin works with our nation's education systems to ensure that every student leaves school prepared for success in postsecondary education and the contemporary workplace.

Our work, based on research and two decades of experience, focuses on K–16 mathematics and science education with an emphasis on strategies for improving student engagement, motivation, persistence, and achievement.

We develop innovative curricula, tools, protocols, and instructional supports and deliver powerful instructional and leadership development.