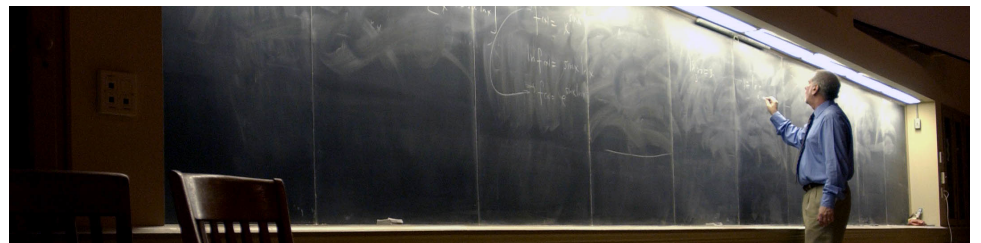


The Charles A. Dana Center

Higher Ed Issue Brief

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The Charles A. Dana Center

The Dana Center is a research unit in the College of Natural Sciences at The University of Texas at Austin.

The Center seeks to strengthen American education systems so that they provide a reliable path to upward mobility for all students, with a special focus on mathematics education. We work at scale by engaging policy partners, developing research-based curriculum and education supports, and building capacity in states, colleges, schools, and districts.

Developmental Education Structures Designed for the Readiness Continuum: Aligning the Co-requisite Model and Student Needs

College readiness is a continuum, not an event. The needs of developmental mathematics students are not uniform, and we should not expect our responses to their needs to be so even when our commitment to acceleration and improved outcomes for students is uniform. This issue brief further explores one popular developmental education strategy, the co-requisite model, and takes a look at the student population it is designed to serve.

College readiness is a continuum, not an event.



A Note About Assessment: It is important to note the limitations of current placement tests in accurately identifying student academic skills as well as the absence of examination of other student characteristics like noncognitive skills and prior academic performance in the placement process. (See Community College Research Center working papers from Scott-Clayton [2012] and Belfield & Crosta [2012] for a more detailed discussion of these issues.) For the purposes of describing the continuum of student needs, we refer to the word *assessment* as the process of identifying student skills and not a placement test specifically.

The Continuum of Student Needs

In thinking about the diversity of students, we present a conceptual framework with four broad categories based on student needs for support in mathematics and noncognitive skill development. Please note that we use approximate placement categories to help define the categories of students due to the limitations of current placement tests (see sidebar).

First, there is the group of students who are currently well served. These students place into college-level courses, are successful, and have no need for additional supports. This group is comprised of approximately 55 to 65 percent of students whose current placement tests indicate they are “college ready” (EdSource, 2012; Calcagno & Long, 2008).

The second category is made up of students who are very close to

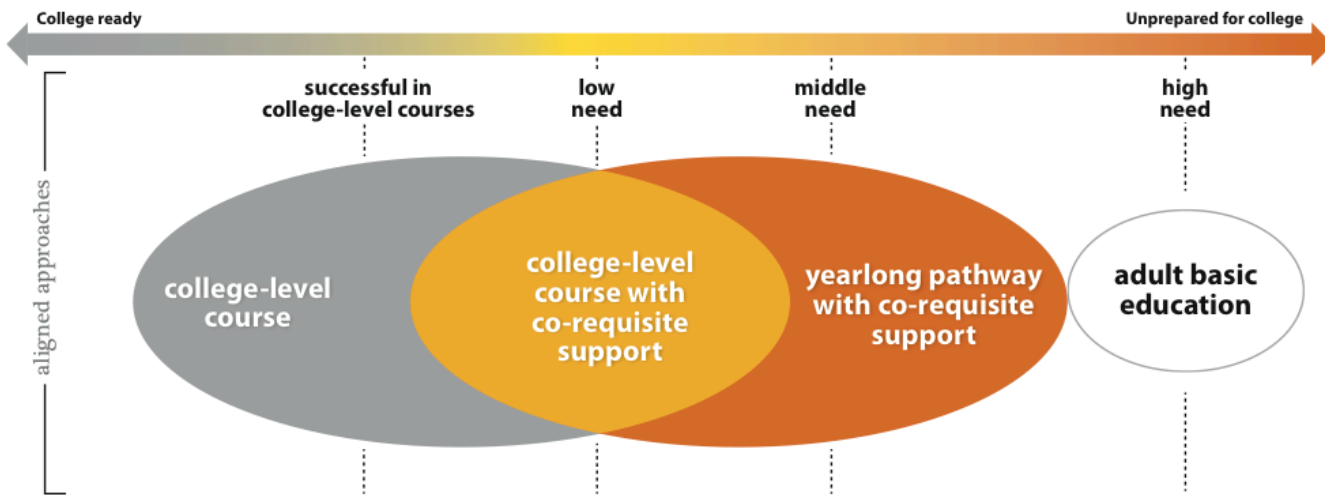
being ready for college-level coursework. These **low-need** students have traditionally been referred to developmental mathematics courses, typically one level below college ready. There is evidence that low-need students can be at least as successful by avoiding developmental coursework as are peers who follow their referral to developmental education. Sometimes these *avoiders* are more successful than the *compliers* in terms of course completion rates (Roska et al., 2009).

This group also includes students who just barely place into college-level mathematics, but are not successful in those courses. Studies show that up to 45 percent of these students, many of them students of color, currently fail first college-level math courses despite being identified as college ready on placement exams (EdSource, 2012).

(continued)

College Readiness Continuum

Diagram of Student Need and Aligned Approaches



The third group consists of students who are further from ready and have moderate levels of need. These **middle-need** students place approximately two to three levels below college-level courses. Students in this group are less likely than those in the first two groups to complete developmental education courses, gateway courses, or a credential (Bailey, Jeong, & Cho, 2010); they are especially unlikely to do so without meaningful foundational skills development.

Finally, the fourth group consists of students who are much further from ready and have high levels of developmental needs (Bailey et al., 2010). These **high-need** students currently place into arithmetic courses or below. Students in this group are very unlikely to succeed in college-level courses, and less than 20 percent ever successfully complete a certificate, degree, or transfer (Roska et al., 2009).

The College Readiness Continuum is a conceptual framework with four broad categories based on student needs for support in mathematics and noncognitive skill development.

Aligned Approaches

One increasingly popular approach to achieving the goals of accelerating student progress and moving students to and through college level as soon as possible is the co-requisite model of developmental education (Commander, Stratton, Callahan, & Smith, 1996; Boylan, 1999; Edgecombe, 2011; Complete College America, 2011).

As we describe in the first issue brief in this series, co-requisite courses are defined as two paired, complementary courses. For the purposes of addressing developmental needs, the co-requisite model traditionally pairs a college-level mathematics course with the highest level developmental

(continued)

We should not presume that all students, especially middle- and high-need students, referred to developmental education would be better off without more robust direct instruction and other learning supports.

mathematics course in the same semester (Edgecombe, 2011; Tinto, 1998). New co-requisite models have experimented with pairing a college-level course with a specialized lab, noncourse-based support options like mandatory tutoring, or with a student success course such as the intensified co-requisite structure of the New Mathways Project (see box). Co-requisite courses like these typically target *low-need* developmental students that are close to college ready.

Is the one-semester co-requisite model right for all students?

Just as critics have argued about traditional developmental education sequences (Boatman & Long, 2010), the co-requisite approach is not a one-size-fits-all solution. There are few examples and little data to suggest that the co-requisite model provides sufficient support for **middle-** and **high-need** developmental students. Furthermore, the premise upon which the co-requisite model is often promoted—that students who avoided developmental education were at least as successful as compliers in terms of completing gatekeeper courses, earning certificates and degrees, and transfer—is not itself an endorsement of the co-requisite model for all students.

The success of avoiders may indicate that developmental education is not an effective strategy and that students are no worse off for having skipped it. On the other hand, it may reveal that students that avoid developmental education referrals differ in important observed academic skills as well as unobserved ways such as motivation, effort, or self-efficacy (Roska et al., 2009). For example, **low-need** students that scored in the top quartile of the Algebra examination in Virginia were twice as likely to skip developmental courses than students who scored in the lower three quartiles (Roska et al., 2009). We should not presume that all students, especially **middle-** and **high-need** students, referred to developmental education would be better off without more robust direct instruction and other learning supports.

It is the professional opinion of the Dana Center and its mathematics experts that **middle-need** developmental students would benefit from a one-year course pathway, also with co-requisite support. We call this the *accelerated structure*. Specifically, this structure is a sequence of two mathematics courses for students who place at the level of Beginning Algebra or who have completed Arithmetic. This sequence allows students to engage immediately with college-

The Intensified Co-requisite Structure

of the New Mathways Project, an initiative of the Dana Center, is a new 2.0 co-requisite model designed for students who are close to college level but need support to be successful. These students will go directly into a one-semester, college-level transferable course in statistics or quantitative literacy along with a mandatory co-requisite student success course.

A key feature of the Dana Center's model is that the college-level mathematics course and the student success course are integrated to support student learning and success. The co-requisite student success course will include just-in-time support for the foundational math skills needed in the college-level course and provide further support for students to develop the skills that they need to carry them through to completion of their programs of study. The mathematics course will be structured to reinforce the learning skills introduced in the student success course.

level content with appropriate support and earn college credit in one year. The first semester math course is also linked with a mandatory student success course.

As described previously, we believe students need support to develop mathematical skills as well as the behaviors, skills, and mindsets needed to be successful in college. In particular, the course will address the problem of transition points between courses by having students learn about and register for the college-level math course aligned to their program and career interests as a part of the student success course. For more information about this course structure, see the Dana Center's webinar, "Introduction of the New Mathways Project," at www.utdanacenter.org/mathways.

As for **high-need** students, few existing innovative or traditional approaches to developmental education have served these students very well. One of the few exceptions is the I-BEST program and others like it that contextualize basic-skills training and align it to certificate programs of study (Jenkins, Zeidenberg, & Kienzl, 2009). We recommend high-need students be referred to these kinds of programs with intentional opportunities to retest and bridge into degree programs. It is important to note that I-BEST and its relatives are not traditional adult basic education programs. The

availability and quality of adult basic education at community colleges is incredibly varied, and this issue requires more study to preserve community colleges' historical commitment to access and equity.

Conclusion

This brief describes the range of student developmental mathematics needs and two remediation approaches aligned to those needs. Of particular interest is the co-requisite model of developmental mathematics and its ability to support low-need students at or near the cutoff for college readiness. The brief also suggests alternative structures like the New Mathways Project's yearlong pathways to better support middle- and high-need students.

The availability and quality of adult basic education at community colleges is incredibly varied, and this issue requires more study to preserve community colleges' historical commitment to access and equity.

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The needs of developmental mathematics students are not uniform, and we should not expect our responses to their needs to be so even when our commitment to acceleration and improved outcomes for students is uniform.

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About the Higher Education Issue Brief No. 2

As we work with our clients and collaborators around Texas and the nation to improve the pathways for students to and through higher education—and onward to rewarding careers—we offer these occasional briefs as thought pieces and inquiries into some of the concepts and issues with which the field is engaging.

Our intent is not to publish a research document or exhaustive investigation, but rather a concise analysis or position statement on a variety of topics. We welcome your feedback and engagement—email us at mathways@austin.utexas.edu.

To learn more about the Dana Center's work in higher education, go to www.utdanacenter.org/mathways.

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