



FAST FORWARD
A Case Study of
Two Community College
Programs Designed
to Accelerate
Students Through
Developmental Math

Executive Summary

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May 2013



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Fast Forward

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Designed to Accelerate Students Through Developmental Math**

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Overview

Community colleges face significant challenges retaining their diverse population of students and helping them progress to graduation. A key barrier is the developmental (or remedial) coursework in reading, writing, and/or mathematics to which a majority of entering students are referred. These lengthy sequences — often required for college-level work — can be daunting, and many students leave college before completing their developmental requirements, let alone attaining a credential. Developmental math, in particular, is a substantial stumbling block to college completion.

To support colleges as they address these challenges, Lumina Foundation for Education launched a national initiative, Achieving the Dream, in 2004. Today, Achieving the Dream is a nonprofit reform network working with nearly 200 colleges nationwide. Many Achieving the Dream colleges and others are experimenting with ways to reform developmental education. Gaining momentum are “acceleration” strategies, which modify the structure and/or pedagogy of developmental math courses to help students move more quickly toward college-level coursework. This report presents a case study of acceleration programs at two Achieving the Dream colleges: Broward College in Fort Lauderdale, Florida, and Tarrant County College in Fort Worth, Texas.

Faculty at Broward developed a model called “Math Redesign” that compresses the traditional sixteen-week developmental math courses into eight weeks, so that students can complete two levels of developmental math in a single semester. The model also includes collaborative problem-solving during class and computer-assisted instruction outside of class. At Tarrant County, faculty divided each developmental math course into three modules, in a program called “ModMath.” Through a more fine-grained placement process, students may be able to skip content that they have already mastered. During class, students work at their own pace on computers using an instructional software package, while the instructor works with students individually. The self-paced nature of ModMath potentially allows students to complete more than three modules per semester.

Key Findings

- Both colleges have succeeded in implementing their programs as originally envisioned, strengthening them, overcoming challenges along the way, and scaling them up to serve more students each year of operation.
- Faculty leaders, motivated by engaged administrators and data-driven decision-making, helped the colleges grow their programs and fold them into broader student success agendas.
- Student outcomes data collected and analyzed by the colleges suggest promising trends associated with the programs, including higher success rates and lower withdrawal rates than for students in traditional math courses at the colleges.

MDRC hopes to obtain funding to conduct an evaluation of Math Redesign and ModMath in order to build knowledge for the field about the implementation and impacts of these acceleration approaches.

Preface

Community colleges play a vital role in American postsecondary education, providing large numbers of Americans with the skills and knowledge to succeed in the 21st-century workforce. While community college enrollments are increasing, graduation rates remain disappointingly low. This is particularly true for students deemed academically unprepared for college-level work. These students, who constitute a majority of first-time community college students, are referred to a sequence of developmental (or remedial) courses. Unfortunately, more than half of these students do not complete their prescribed sequence. Colleges across the country are trying to reform developmental education — how it is organized and how it is taught — so that more students earn credentials or take less time to do so.

For the past decade, MDRC has evaluated a number of interventions designed to improve the outcomes of community college students, including enhanced counseling, learning communities, and financial incentives. Encouragingly, many of these strategies have produced positive effects, affirming that changes in institutional practices and policies can help more students succeed. At the same time, however, it is becoming increasingly clear that the effects of modest, short-term interventions tend to be small and to diminish after the program ends.

Increasing in popularity are instructional reforms aimed at accelerating students through the developmental course sequence, for example, by compressing the material into fewer semesters, allowing students to move through it at their own pace, or placing students directly into college-level courses with extra support. Reforms that make such deep changes to course structure and classroom instruction — like those profiled in this report — may have the potential for larger and more sustained impacts on student outcomes.

This report describes the experiences of two colleges in designing, implementing, and scaling acceleration programs in developmental math. The authors hope that lessons learned from these two programs are useful to practitioners considering acceleration programs as well as to policy-makers seeking new and effective strategies to significantly increase the number of students who earn a credential. MDRC hopes to obtain funding to formally evaluate these two programs in the years to come.

Gordon L. Berlin
President

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The Authors

Executive Summary

Despite steadily increasing enrollments in community colleges, graduation and transfer rates remain disappointingly low. Six years after entering community college, almost half of first-time students are not enrolled at any institution and have not received a degree or certificate.¹ Students who take developmental courses for remediation in reading, writing, and math face even steeper odds.² Most students do not complete the developmental sequence, let alone attain a credential, and developmental math, in particular, is a formidable obstacle. With a lengthy series of courses, the developmental math sequence may not be optimally structured to retain students; research shows that most students who exit the sequence do so because they do not enroll in one of the courses, rather than because they fail or withdraw from a course.³ In addition, developmental math classes are typically characterized by lectures and rote, procedural learning — an approach that may inhibit mathematical proficiency as well as student engagement in math and in college.⁴

Recognizing these challenges, Lumina Foundation for Education launched a national initiative called “Achieving the Dream: Community Colleges Count” in 2004, alongside a group of partner organizations. As part of their Achieving the Dream work, participating colleges seek, implement, evaluate, and refine promising practices to improve student outcomes. This report profiles two such practices implemented by Achieving the Dream colleges: programs at Broward College in Fort Lauderdale, Florida, and at Tarrant County College in Fort Worth, Texas, aimed at accelerating students’ progress through the developmental math sequence, so that they may then go on to earn credentials or transfer.

Acceleration reforms in community college developmental education programs are gaining momentum across the country. By restructuring course sequences, content, pacing, and/or pedagogical approaches in an effort to move students to college-level courses more quickly, they represent a bold, innovative agenda for developmental education reform. Approaches to acceleration include:

- **Compression.** Developmental courses are offered in a compressed time frame, so students can complete multiple levels of developmental education in a single semester.

¹Alexander Walton Radford, Lutz Berkner, Sara C. Wheelless, and Bryan Shepherd, *Persistence and Attainment of 2003-04 Beginning Postsecondary Students: After 6 Years* (Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, 2010).

²Clifford Adelman, *Principal Indicators of Student Academic Histories in Postsecondary Education, 1972-2000* (Washington, DC: U.S. Department of Education, Institute of Education Sciences, 2004); Paul Attewell, David Lavin, Thurston Domina, and Tania Levey, “New Evidence on College Remediation,” *Journal of Higher Education* 77, 5: 886-924 (2006).

³Thomas Bailey, Dong Wook Jeong, and Sung-Woo Cho, “Referral, Enrollment, and Completion in Developmental Education Sequences in Community Colleges,” *Economics of Education Review* 29, 255-270 (2010).

⁴W. Norton Grubb with Robert Gabriner, *Basic Skills Education in Community Colleges: Inside and Outside of Classrooms* (New York: Routledge, 2013).

- **Modularization.** Developmental courses are divided into discrete learning units; students complete only the modules that they need.
- **Curricular reforms.** Developmental curriculum is redesigned to decrease the number of courses that students need to take or to better align with what students need to know to succeed in college-level courses.
- **Mainstreaming and paired courses.** Developmental students enroll directly in college-level courses, linked either with a related developmental course or with supplemental support services.

This case study focuses on Math Redesign, a compression program at Broward College in Fort Lauderdale, Florida, and ModMath, a modularization program at Tarrant County College in Fort Worth, Texas. In addition to these structural changes, the two programs also incorporate pedagogical reforms, including computer-assisted instruction. They arose organically from departmental efforts to reform developmental math; although the specific models are “homegrown,” they incorporate features common across other acceleration programs. This case study seeks to provide practical information about how Broward and Tarrant County designed and operated their particular versions of a compression and modularization approach, respectively, so that other colleges interested in implementing an acceleration strategy of their own may learn from Broward’s and Tarrant County’s experiences.

Two Acceleration Models

Math Redesign at Broward College

Math Redesign compresses what is typically a sixteen-week course into eight weeks, allowing students to complete two levels of math in a single semester. Math Redesign students complete the same number of class hours — and cover identical curricular content — as they would in a sixteen-week course. In addition to compression, Math Redesign changes the way that instructors deliver curricular content in class. Classes begin with immediate feedback to students, as instructors return graded worksheets completed the previous session and go over common issues with the class. Next, instructors present the lesson through brief, standardized instructional videos, interspersed with their own commentary. For the remainder of the class time, generally around half an hour, students collaborate with one another on a problem-solving worksheet, with the instructor moving around the classroom facilitating group work and providing one-on-one assistance as needed. Math Redesign students continue their learning outside the classroom with computer-assisted instruction in the Assessment and Learning in Knowledge Spaces (ALEKS) system.

Compared with students in traditional developmental math classes, students in Math Redesign spend more class time actively engaged in problem-solving rather than listening to a lecture, and this active learning environment is theorized to support student engagement and

mastery. One of Broward’s math associate deans described the Math Redesign approach as “very student interactive.” In contrast to traditional developmental math courses in which instructors primarily lecture to students, she added, Math Redesign instructors play “more [of] a facilitator” role.

ModMath at Tarrant County College

ModMath divides each of Tarrant County’s three semester-long developmental math courses into three modules of five weeks each. Students begin by taking an additional placement test to determine their starting module,⁵ and they enroll in three modules per semester. Classes consist of students working with an instructional software package, MyMathLab, at their own pace, with an instructor circulating to work with individual students. Students working quickly and effectively can take the final exam early and can move ahead to the next module, potentially completing more than three modules per semester.

By dividing the curriculum into modules, ModMath allows students to leave and return (or fail and return) without losing as much ground as they would in semester-length courses. Additionally, as in Math Redesign, ModMath students work on math problems in class, engaging them in solving problems and applying skills. The self-paced approach may help keep students motivated and engaged, as well as enable faster mastery of math concepts; students can move quickly through material that they pick up easily, while having the opportunity to spend more time to master concepts that they find more difficult.

Key Lessons

Bringing an acceleration model from idea to reality requires thoughtful planning and ongoing decision-making by program leaders. At Broward, Math Redesign is primarily coordinated by each campus’s math associate dean, working with faculty leaders and drawing on support at the college level. A faculty member at Tarrant County coordinates ModMath, with support from senior administrators on her campus. These leaders work to schedule the classes, recruit students and faculty, train faculty, strengthen the model, manage administrative tasks, and expand the program. The experiences of Broward and Tarrant County — each of which has fine-tuned its program over several years — may provide valuable lessons to other colleges that are selecting, designing, or implementing developmental math acceleration programs.

Scheduling Course Sections

Since scheduling course sections can be logistically challenging, program leaders have worked to address these challenges in ways that also maximize the opportunity for students to accelerate through the developmental courses. Because Math Redesign classes typically meet four days each week, ensuring classroom space for a growing number of sections can be a

⁵This test is in addition to the placement test taken by all new students at Tarrant County.

challenge. To optimize use of classroom space, associate deans schedule the classes in pairs, one during the first eight weeks of the semester and the other in the same classroom at the same time during the second eight weeks. They try to set up these pairs so that a student who passes the first class can enroll in the next one in the same room, during the same time, with the same instructor. This supports cohorts of students continuing together with the same instructor and facilitates acceleration, removing scheduling and teacher selection barriers for students who are planning to complete two classes in one semester.

Tarrant County adopted a “one-room schoolhouse” format of mixed modules that has assisted with scheduling and may enable more students to move at a faster pace. Early versions of ModMath consisted of classes offered for a single module, and instructors typically lectured part of the time. However, offering separate sections for each module made it difficult to meet enrollment minimums, so the program shifted toward a model in which classes include students from multiple modules. These classes fill more easily because they can accommodate students from any level. Moreover, as mixed-module classes are entirely self-paced, they allow some students to work more quickly and accelerate their progress.

Student Recruitment

Once the class schedules are set, ensuring that a sufficient number of students enroll in the classes has been a continual challenge at both colleges, partly because advisers and students lack knowledge about the programs. To recruit students to Math Redesign, math associate deans work with college advising staff to promote the program to students. For ModMath, the program coordinator hopes to do additional outreach to educate advisers about the program, so that more students learn about it. Students at both colleges often hear about the programs through word of mouth, particularly as the programs have increased in scale. Going forward, leaders at both colleges continue to think about how best to promote Math Redesign and ModMath.

Colleges that are considering acceleration programs might also consider increasing student awareness of the benefits of moving through developmental requirements more quickly. Students may not know that these classes can help them save money on coursework and/or move more quickly toward a credential. Students who have less confidence in their math abilities may be hesitant about a class termed “accelerated” or “fast,” so coordinators and advisers might emphasize how the classes are designed to benefit students at all levels. For example, compression programs might highlight the increased mastery theorized to occur with more frequent class sessions. Modularization programs are well suited to students with conflicting demands on their time or those who prefer a slower pace. Highlighting these benefits for students might increase their interest in the program.

Faculty Recruitment and Training

Instructors currently volunteer to teach Math Redesign and ModMath. Program leaders encourage other instructors to volunteer through informal personal outreach and periodic

information sessions. As the models feature instructional techniques that significantly transform the role of the instructor, leaders of both programs emphasized faculty development as a key consideration for colleges working to begin or strengthen acceleration programs. For example, new Math Redesign instructors may find it challenging or potentially threatening to their sense of professional autonomy to incorporate videos. Likewise, ModMath instructors may need support to adjust to the flexibility and individualized instruction that are central to the model.

To prepare faculty to teach in the new model, the two colleges have offered different training activities over the first few years. As is common at community colleges, training has not yet been formalized or made strictly mandatory for instructors, though both colleges are considering how to structure professional development moving forward. Colleges that are considering implementing acceleration programs should allocate resources for regular, intentional professional development. Providing clarity about the model may help instructors feel more comfortable and help them implement the model more consistently. Incorporating peer observations into trainings could also help instructors learn from one another and become more effective teachers in the new model.

Cross-College Collaboration

While ostensibly situated solely within a college's math department, programs like Math Redesign and ModMath have a much broader reach, with potential implications for course scheduling, information technology systems, financial aid, testing, and student advising. Math Redesign and ModMath program leaders emphasized collaboration with these other divisions as being crucial for program setup as well as continued operation. As discussed above, recruiting students to participate in accelerated classes can be a challenge, so the leaders of acceleration programs should collaborate early and regularly with advising and testing staff. Support from other divisions on campus can also reduce the administrative burden on program leaders and instructors, streamlining operations and helping the program move to a larger scale.

Program Evaluation and Scale-Up

Math Redesign and ModMath have gradually expanded their programs to serve more students. Both colleges started small with their programs and grew through a purposeful, grassroots approach to scaling. They focused in the initial years on planning carefully, building support, and continually developing, evaluating, and strengthening the model. At both colleges, faculty — not college administrators — led the design, developed the new courses, took ownership of the program, and made modifications as the program developed. This core group of faculty brought others on board through a grassroots approach. The programs also engaged college leaders from the beginning, who supported the program but encouraged faculty to continue leading it. Additionally, both colleges collected and analyzed data on student outcomes in the accelerated math classes. Promising data have played a key role in supporting scaling, helping to build engagement and inform program refinement.

Next Steps

Both Broward College and Tarrant County College plan to continue evaluating and refining their accelerated math programs. Program coordinators consider the programs sustainable and cost effective. Broward plans to continue scaling up and analyzing data on Math Redesign as part of the college-wide strategic plan, and Tarrant County is thinking about how to incorporate ModMath into other developmental math efforts. Both colleges want data on program effectiveness to determine how best to move forward amid numerous strategies and initiatives aimed at improving student outcomes in developmental math.

To date, neither of these programs or acceleration approaches has been rigorously evaluated, despite their promise for moving students through developmental math and the approaches' growing popularity at community colleges across the country. While data collected by the two colleges show promising trends associated with the programs, students who choose to participate in these programs may differ from those who do not, for example, in motivation or prior academic experience. Further research is needed to establish causal evidence of the effectiveness of the two programs. Should funding become available, MDRC looks forward to partnering with Broward and Tarrant County to conduct an evaluation of the programs. Such an evaluation would use a random assignment research design to compare the outcomes of students who have the opportunity to enroll in the accelerated courses with a comparable group of students who do not have this opportunity. MDRC would also study the implementation of the programs. Findings from this evaluation would provide policymakers and community college practitioners with reliable evidence on which to base decisions about how best to improve student outcomes.

Earlier Publications on Achieving the Dream

Progress in the First Five Years: An Evaluation of Achieving the Dream in Washington State.
2012. Davis Jenkins, John Wachen, Monica Reid Kerrigan, and Alexander K. Mayer with Oscar Cerna, Dan Cullinan, and Phoebe Richman.

*Keeping Students on Course:
An Impact Study of a Student Success Course at Guilford Technical Community College.*
2012. Elizabeth Zachry Rutschow, Dan Cullinan, and Rashida Welbeck.

*Leading by Example:
A Case Study of Peer Leader Programs at Two Achieving the Dream Colleges.*
2012. Oscar Cerna and Caitlin Platania with Kelley Fong.

Turning the Tide: Five Years of Achieving the Dream in Community Colleges.
2011. Elizabeth Zachry Rutschow, Lashawn Richburg-Hayes, Thomas Brock, Genevieve Orr, Oscar Cerna, Dan Cullinan, Monica Reid Kerrigan, Davis Jenkins, Susan Gooden, and Kasey Martin.

Investing in Change: How Much Do Achieving the Dream Colleges Spend — and from What Resources — to Become Data-Driven Institutions?
2010. Elizabeth M. Zachry and Erin Coghlan with Rashida Welbeck.

Terms of Engagement: Men of Color Discuss Their Experiences in Community College.
2010. Alissa Gardenhire-Crooks, Herbert Collado, Kasey Martin, and Alma Castro with Thomas Brock and Genevieve Orr.

Collaborating to Create Change: How El Paso Community College Improved the Readiness of Its Incoming Students Through Achieving the Dream.
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*Guiding Developmental Math Students to Campus Services:
An Impact Evaluation of the Beacon Program at South Texas College.*
2010. Mary G. Visher, Kristin F. Butcher, and Oscar S. Cerna with Dan Cullinan and Emily Schneider.

Building Student Success from the Ground Up: A Case Study of an Achieving the Dream College.
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2009. Davis Jenkins, Todd Ellwein, John Wachen, Monica Reid Kerrigan, and Sung-Woo Cho.

*Faculty and Administrator Data Use at Achieving the Dream Colleges:
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*Promising Instructional Reforms in Developmental Education:
A Case Study of Three Achieving the Dream Colleges.*
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MDRC is a nonprofit, nonpartisan social and education policy research organization dedicated to learning what works to improve the well-being of low-income people. Through its research and the active communication of its findings, MDRC seeks to enhance the effectiveness of social and education policies and programs.

Founded in 1974 and located in New York City and Oakland, California, MDRC is best known for mounting rigorous, large-scale, real-world tests of new and existing policies and programs. Its projects are a mix of demonstrations (field tests of promising new program approaches) and evaluations of ongoing government and community initiatives. MDRC's staff bring an unusual combination of research and organizational experience to their work, providing expertise on the latest in qualitative and quantitative methods and on program design, development, implementation, and management. MDRC seeks to learn not just whether a program is effective but also how and why the program's effects occur. In addition, it tries to place each project's findings in the broader context of related research — in order to build knowledge about what works across the social and education policy fields. MDRC's findings, lessons, and best practices are proactively shared with a broad audience in the policy and practitioner community as well as with the general public and the media.

Over the years, MDRC has brought its unique approach to an ever-growing range of policy areas and target populations. Once known primarily for evaluations of state welfare-to-work programs, today MDRC is also studying public school reforms, employment programs for ex-offenders and people with disabilities, and programs to help low-income students succeed in college. MDRC's projects are organized into five areas:

- Promoting Family Well-Being and Children's Development
- Improving Public Education
- Raising Academic Achievement and Persistence in College
- Supporting Low-Wage Workers and Communities
- Overcoming Barriers to Employment

Working in almost every state, all of the nation's largest cities, and Canada and the United Kingdom, MDRC conducts its projects in partnership with national, state, and local governments, public school systems, community organizations, and numerous private philanthropies.