*Executive Summary*

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## What We Know About Improving Developmental Education

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June 2011

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BUILDING KNOWLEDGE TO IMPROVE SOCIAL POLICY

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# Overview

One of the greatest challenges that community colleges face in their efforts to increase graduation rates is improving the success of students in their developmental, or remedial, education programs — the courses that students without adequate academic preparation must take before they can enroll in courses for college credit. Emphasizing results from experimental and quasi-experimental studies, this literature review identifies the most promising approaches for revising the structure, curriculum, or delivery of developmental education and suggests areas for future innovations in developmental education practice and research. This analysis focuses on four different types of interventions for improving students' progress through remedial education and into college-level courses, including (1) strategies that help students avoid developmental education by shoring up their skills before they enter college; (2) interventions that accelerate students' progress through developmental education by shortening the timing or content of their courses; (3) programs that provide contextualized basic skills together with occupational or college-content coursework; and (4) programs that enhance the supports for developmental-level learners, such as advising or tutoring.

While research on best practices in developmental education abounds, little rigorous research exists to demonstrate the effects of these reforms on students' achievement. Programs that show the greatest benefits with relatively rigorous documentation either mainstream developmental students into college-level courses with additional supports, provide modularized or compressed courses to allow remedial students to more quickly complete their developmental work, or offer contextualized remedial education within occupational and vocational programs. These strategies show the most promise for educators and policymakers who must act now, but they should also continue to receive attention from researchers. Many of the strategies have not yet been evaluated using more rigorous and reliable research methods, and/or early promising results have not been replicated in other settings.

This literature review also notes several promising reforms that merit further study: technology-aided approaches, improved alignment between secondary and postsecondary education, and curricular redesign that reconsiders the key skills that academically underprepared students will need in their careers. Finally, it flags two generic issues — placement assessments and faculty support — that will likely need to be addressed for community colleges to see large-scale changes in their developmental-level students' achievement.

# Preface

In recent years it has become clear that the United States must focus serious efforts on raising the graduation rates of community college students if we are to see higher levels of educational attainment nationally and improve the quality and competitiveness of our workforce. The challenge for community colleges is to pave the way to success for the tens of thousands of academically underprepared students who are enrolled in developmental, or remedial, courses. Building a strong research base that can inform educators and policymakers about effective developmental education strategies is of central importance in helping these struggling students.

In September 2010, the National Center for Postsecondary Research hosted a national conference to bring leaders in the field together to discuss "Developmental Education: What Policies and Practices Work for Students?" To complement presentations on current innovations, MDRC conducted a literature review to uncover the most promising reforms of the past 40 years and suggest future areas for research and practice.

This review emphasizes results of rigorous studies that compared outcomes for students who participated in an innovative program with those whose developmental education was more traditional — typically, a sequence of courses relying on lectures and drills to prepare students for college-level work in math, English, or reading. Guided by these standards for evidence, this review finds that the most promising strategies are those that work to improve students' skills within a compressed time frame or that link remediation to relevant vocational coursework.

As these programs are replicated, they should be evaluated rigorously to confirm the promising trends seen in the studies. But educators, policymakers, and researchers should not stop there. Even the most promising innovations described in this report led to only modest improvements in achievement, demonstrating that progress remains to be made in developing and evaluating more robust reforms. In particular, this review highlights technology-aided approaches, curricular redesign, and current efforts to align secondary school education with college readiness standards as areas with great potential but where research has been limited. It also suggests that community colleges should carefully consider the assessments that they use to place students in developmental education as well as the support that they provide to both full-time and adjunct faculty to teach well and participate in reforms.

The research demonstrates that minor modifications in developmental education programs are unlikely to produce dramatic improvements. Given that current programs succeed at moving less than half of their students into college-level courses, more substantive and transformative changes are needed.

Gordon L. Berlin
President

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The Authors

# Executive Summary

Enrolling over one-third of all postsecondary education students, community colleges have become a centerpiece of America's efforts in recent years to improve the quality of its workforce and maintain its competitiveness in the global market.[1] However, community colleges have often struggled to graduate their students, with just over three in ten community college students earning a degree or credential within six years of first enrolling.[2] Over half of these students are academically underprepared for college-level work, and improving the success of these developmental, or remedial, students is one of the greatest challenges that community colleges face in the efforts to increase overall graduation rates — very few of these students end up completing their required sequence of developmental coursework needed to enroll in college-level courses, let alone graduating from college with a diploma or certificate.[3]

There is a strong and growing effort among educators and policymakers to address the needs of these students; however, the available research on effective practices is limited in its rigor and reliability. Emphasizing results from experimental and quasi-experimental studies, this literature review identifies the most promising approaches for revising the structure, curriculum, or delivery of developmental education: strategies that work to improve students' skills within a compressed time frame or that link remediation to relevant college-level work. These strategies tend to modify pedagogical approaches to fit the programs' nontraditional structures, and they provide clear opportunities for students to remain on a pathway to reaching their college goals rather than becoming mired in years of remedial work. Building on these findings, therefore, this literature review suggests areas for future growth in developmental education research and practice, identifies several untested reforms that merit further study, and flags two generic issues — placement assessments and faculty support — that will likely need to be addressed for community colleges to see large-scale changes in their developmental-level students' achievement.

## Promising Strategies for Improving Developmental Education Students' Success

This review categorizes colleges' approaches to improving developmental education into four broad types of interventions:

[1] Provasnik and Planty (2008).

[2] Radford, Berkner, Wheeless, and Shepherd (2010).

[3] Adelman (2004); Attewell, Lavin, Domina, and Levey (2006); Jenkins, Jaggars, and Roksa (2009); Bailey, Jeong, and Cho (2010).

1. Interventions aimed at helping students *avoid* developmental education by shoring up their skills before they enroll in college

2. Interventions designed to *accelerate* students' progress through developmental education by shortening the timing or content of their developmental education courses

3. Programs that provide *contextualized* basic skills together with occupational or college-content coursework

4. Programs that enhance the *supports* for developmental-level learners, such as advising or tutoring

Of these, acceleration and contextualization strategies appear to hold the most promise for improving developmental education students' success. In particular, programs that show the greatest benefits with relatively rigorous documentation either mainstream developmental students into college-level courses with additional supports, provide modularized or compressed courses to allow remedial students to more quickly complete their developmental work, or offer contextualized remedial education within occupational and vocational programs. These strategies should be prioritized by educators and policymakers and should continue to receive attention from researchers, as none of them have yet been evaluated using an experimental design.

### Defining Rigorous Research

The review focused on studies that had large samples of students and included some type of comparison group research design to determine the effectiveness of a program over and above the regular services offered. The most rigorous studies use an *experimental design*, in which students are randomly assigned either to a program group that receives an intervention or to a control group that does not. Random assignment ensures that before enrollment in the intervention begins, students in both the program group and the control group are similar in measurable and unmeasurable characteristics such as motivation; hence, any subsequent differences that emerge in students' outcomes can be attributed with confidence to the intervention. *Quasi-experimental research designs* also take a rigorous approach to creating comparison groups; these studies use various methods to identify a similar group of students and then to control for any measurable (but not unmeasurable) differences in background characteristics between students who participate in the program and the comparison group. However, these results are generally not as reliable as the findings from experimental studies because such techniques cannot control for unmeasurable characteristics (and, thus, cannot fully account for the selection of students into an intervention). Experimental and quasi-experimental studies are fairly uncommon in higher education, and so the review also includes nonexperimental studies that use some other methodology to create a comparison group. While there is a range of

nonexperimental approaches, most available studies in the field are *simple comparisons* that contrast outcomes for program participants with outcomes for a historical or current group of students at a similar level of developmental need, without controlling for differences in student characteristics. The results of such studies provide insights into the promise of many developmental education reforms and suggest directions for future evaluation.

### Avoidance Models

Models that help students better prepare for college-level work *before* they enter postsecondary education have shown some promise for improving students' achievement. One type of program in this category alerts students to their academic weak points before they leave high school. Eleventh- or twelfth-graders take *early college-readiness assessments*, and those who are academically underprepared are given the opportunity to further develop their skills in high school or through bridge programs at the college, which offer students compressed developmental-level courses during the summer before their entry into college. *Dual enrollment programs* and *early college high schools* are another high school-based preparation program. These programs enroll students jointly in college and high school classes together during their final years of high school, with a specific focus on college preparatory coursework for students who are academically underprepared in a particular subject.

Research on interventions helping students avoid developmental education is promising, though relatively limited in rigor. Nonexperimental research on dual enrollment programs have shown positive increases in students' credit earning,[4] while similar research on summer bridge programs has shown promising improvements in students' study skills and college readiness in math and reading.[5] A more rigorous study of an early assessment program in California also revealed modest decreases in students' placement into developmental math and English when controlling for preexisting differences between participating and nonparticipating students.[6] Further research is needed to confirm these promising trends with more rigorous evaluation designs, and researchers should pay special attention to how various program structures may benefit students with differing levels of need.

### Acceleration Models

Acceleration models have also shown promise for increasing students' progress through developmental education. Several different models currently exist, including *fast-track courses*, which compress the developmental education course curriculum into several weeks or a half

[4]Kim and Barnett (2008); Jobs for the Future (2009).
[5]Texas Higher Education Coordinating Board (2009); Zuniga (2008).
[6]Howell, Kurlaender, and Grodsky (2010).

semester; *self-paced,* or *modularized, courses,* which break apart semester-long developmental education classes into smaller, competency-based units; and *mainstreamed courses,* in which developmental education students are placed directly into college-level courses, often with additional supports such as tutoring or study skills courses.

Nonexperimental research on each program type has shown higher pass rates in developmental and subsequent college-level courses (both in math and in English), as well as higher rates of student persistence.[7] One quasi-experimental study has also shown promising results for a mainstreaming program in developmental English at the Community College of Baltimore County. Students in the mainstreamed classes were much more likely to pass the college's introductory college-level English course within a year of taking the course than students not participating in the program. The program was also associated with improvements in the number of college-level courses that students attempted and with the percentage of students who passed the next level of college English.[8]

The positive results of these studies reveal that acceleration strategies are ripe for more rigorous evaluation. Because students who participate in these programs may have differences in motivation or prior academic achievement, further research is needed to establish a causal link between these programs and any observed increases in achievement. As these practices are replicated and evaluated more thoroughly, close attention should be paid to the policy environment; resistance to modifying developmental courses in this way has been seen at both the practitioner and the state levels, but flexible policies on course credit and prerequisites can also be central to easing implementation.[9]

### Contextualized Learning Models

*Contextualized instructional models* seek to help academically underprepared students progress more quickly through their developmental skill building while engaging directly with their academic or vocational field of interest.[10] In vocational programs, contextualized learning affords students the opportunity to gain professional or technical skills while still enrolled in their precollegiate programs. Contextualized learning may also be used in particular academic subjects to promote students' integration of course concepts with reading, writing, or math skills. Finally, *learning communities,* in which students co-enroll in developmental courses

[7]Zachry (2008); Adams (2003); Brancard, Baker, and Jensen (2006); Bragg (2009); Bassett (2009); Bragg and Barnett (2009); Epper and Baker (2009); Goen-Salter (2008); Adams, Miller, and Roberts (2009); Jenkins (2009).

[8]Jenkins et al. (2010).

[9]Moltz (2010); Jenkins (2009); Gleason (2000); Bassett (2009).

[10]Grubb and Kraskouskas (1992); Berns and Erickson (2001); Perin (2001); Badway and Grubb (1997).

linked with college-level courses, can provide integrated environments to engage with both academic course content and basic skills learning.

While the evidence is still limited, rigorous research does exist about the success of contextualized learning programs. Nonexperimental evaluations of several vocationally focused programs that were developed as part of the Charles Stewart Mott Foundation's Breaking Through initiative revealed promising college outcomes, such as increased rates of college readiness and increased progress toward completing occupational certificates.[11] A quasi-experimental study of Washington State's Integrated Basic Education and Skills Training (I-BEST) program — which offers basic English instruction, including discipline-specific vocabulary training and lessons on employer and employee communications, within the context of specific workforce training classes, such as commercial driving, nursing, and early childhood education — found that students in the I-BEST programs earned an average of 14 more college credits than non-I-BEST students and had a higher probability of persisting into the second year (17 percentage points) and of earning an occupational certificate (40 percentage points).[12] Given the promising findings from I-BEST and Breaking Through, developmental education programs should consider how links with occupational courses might further improve their students' outcomes. Additionally, more rigorous research should be conducted to validate the promising results of programs following this model.

Positive, though more modest, findings have also been observed for learning communities. Qualitative and quasi-experimental analyses of learning communities throughout the country have shown that these programs have affective benefits for students, leading to high levels of engagement and a strong sense of belonging.[13] Experimental studies have also found positive impacts on students' achievement and persistence in school; learning communities programs that link a developmental math or developmental English class with a college-level course have resulted in improvements in the number of credits earned and in students' progression through developmental education.[14] However, these effects tended to diminish after the programs ended. These results should be considered a more definitive characterization of learning communities, given the strong research models used to document these effects.

### Student Supports

Increasing the supports that developmental education students receive outside the classroom has been another way that many community colleges have attempted to improve academ-

[11]Bragg and Barnett (2009).

[12]Jenkins, Zeidenberg, and Kienzl (2009).

[13]Visher, Schneider, Wathington, and Collado (2010); Engstrom and Tinto (2008); Tinto (1997); Zhao and Kuh (2004).

[14]Scrivener et al. (2008); Weissman et al. (2011).

ic achievement. Popular strategies include *tutoring* — which can be provided by faculty, staff, or student peers or through computer-assisted instruction with tutorial software packages — and *supplemental instruction*, a more structured tutoring model that is connected directly with a particular course. *Intensive advising*, which reduces advisers' caseloads, allowing them to meet more frequently with students and provide more personalized attention, is another often-recommended intervention, though it can be expensive to implement on a large scale. *Student success courses*, which teach students study skills and provide an introduction to college life, are also a popular strategy.

Rigorous research about these strategies is limited, and the available evidence reveals mixed results on student achievement. While some promising trends have been noted for tutoring programs — particularly for students who use learning assistance centers or who receive supplemental instruction — most studies were limited in what they could attribute to the influence of these programs versus other factors, such as student motivation.[15] Rigorous research on advising models has also shown some positive results for students' retention and credit earning. However, the effects of these programs were relatively modest, dissipated over time, and generally did not affect other academic outcomes for these students, such as course pass rates or grade point averages (GPAs).[16] Student success courses have seen more promising results, with experimental studies showing positive gains in credits earned and progression through developmental education, while quasi-experimental studies revealed other positive, long-term effects on degree earning and transfers, particularly for developmental-level students.[17] These findings suggest that certain supplemental support services, such as student success courses, may produce important gains in students' achievement. More rigorous research is needed, however — particularly concerning tutoring and supplemental instruction programs — to determine whether these services have a measurable effect on students' achievement and progress into college-level work.

## Untested Innovations in Developmental Education Practice

While most developmental education reforms have focused on modest tweaks to programs' curricula and practices, a few recent innovations have focused on changing the foundations of these programs in an effort to more quickly advance students into credit-bearing courses and the attainment of postsecondary credentials. Three reforms, in particular, that provide novel ways to

[15]Perin (2004); Roueche, Ely, and Roueche (2001); Xu, Hartman, Uribe, and Mencke (2001).

[16]Visher, Butcher, and Cerna (2010); Scrivener and Weiss (2009); Bettinger and Baker (2011).

[17]Zeidenberg, Jenkins, and Calcagno (2007); Scrivener et al. (2008); Scrivener, Sommo, and Collado (2009).

improve developmental education students' success are worthy of further study as they are replicated at community colleges across the nation.

- **Technology-aided approaches.** Many colleges use technology to revise curricula or instruction in developmental courses, relying on computer tutorials — such as MyMathLab, Plato, or ALEKS — or other methods to supplement classroom instruction, to provide online developmental education, or to structure accelerated or modularized courses.[18] Little research has been conducted on these strategies despite their popularity, and the research that exists shows mixed results.

- **Improving alignment between secondary and postsecondary education.** Numerous movements are currently under way to better align these systems, including the Common Core State Standards Initiative, which sets out career- and college-ready standards for high school curricula.[19] Given the important influence that such alignment practices can have on developmental education students' success, researchers and policymakers should prioritize research to better understand how these policy efforts are making changes in students' educational experiences and achievement.

- **Curricular redesign.** Other recent efforts are radically reconsidering the curricula and practices in both developmental and college-level courses to focus on the key skills that students will need in their careers. One of the most promising of these innovations, the Statistics Pathway (or Statway), seeks to quickly advance academically underprepared students in nontechnical fields through a statistics-based (rather than an algebra- and calculus-based) math curriculum in one year.[20] Though untested, programs such as Statway provide a unique answer to researchers' recent calls for more drastic changes in developmental education and provide a promising venue for exploring how more dramatic reforms may affect students' outcomes.

## Conclusion

Developmental education remains an area ripe for further research and innovation. Given the alarmingly low success rates for developmental students, these programs can no longer afford

[18]Carpenter, Brown, and Hickman (2004); Zavarella and Ignash (2009); Creery (2001); McClenden and McArdle (2002); Weems (2002); Blackner (2000); Epper and Baker (2009).

[19]Achieve, Inc. (2010); American Youth Policy Forum (AYPF) (2009); National Governors Association (2010).

[20]Bryk and Treisman (2010).

the status quo. The current research demonstrates that minor modifications in developmental education programs are insufficient for producing dramatic improvements in student achievement. Educators, policymakers, and researchers, however, have an opportunity to build on what has been learned about promising interventions in order to develop and rigorously evaluate more robust and innovative efforts aimed at transforming the educational experience of academically underprepared students. As the field advances, it will become increasingly important to replicate these early results using more rigorous and reliable methods whenever possible; if an experimental study is not feasible, another analytic strategy that minimizes the differences between comparison groups should be used.

In addition, to be successful on a wide scale, new reforms in developmental education need to address two institutional issues at the core of programming and practice:

- **Placement assessments.** On entering community college, most students are required to take an entrance exam that assesses their current math, reading, and writing skills and is used to place them into the appropriate developmental or college-level courses. While such assessments are designed to aid colleges' placement practices and are encouraged by earlier developmental education research, there is much debate as to their validity and their benefits for students. Given the important role of assessment and placement in defining students' college careers, researchers and policymakers should place a high priority on developing more nuanced placement methods and on understanding how they affect students' progress through college.

- **Faculty support.** The majority of developmental education classes are taught by adjunct, or part-time, faculty, who are often disconnected from departmental decision-making and the piloting of new programmatic strategies. Moreover, developmental education instructors — whether they teach full or part time — tend to have limited training in instructing basic skills students. The level of quality and effectiveness of instruction are undoubtedly among the most important factors influencing developmental-level students' academic performance; in recognizing this, educators, policymakers, and researchers should develop more integrated approaches to professional development that are designed to provide ongoing support to faculty as they implement new reforms and bring them to scale. Researchers should move beyond the cursory treatment of instructors' pedagogy and practice within the classroom and should rigorously document the relationship between instructional practices and student outcomes; a useful tool for this work would be more standardized measures for assessing the implementation of different practices.

Improvements in these areas have the potential to enhance traditional developmental education programs, even as colleges pursue more dramatic reforms that may have an even larger impact on student achievement. By attacking the challenge of developmental education on each of these levels, educators, policymakers, and researchers will give academically disadvantaged students the opportunity to achieve the college and career dreams that they are so avidly pursuing.

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# About MDRC

MDRC is a nonprofit, nonpartisan social 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 Child Development
- Improving Public Education
- Promoting Successful Transitions to Adulthood
- 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.