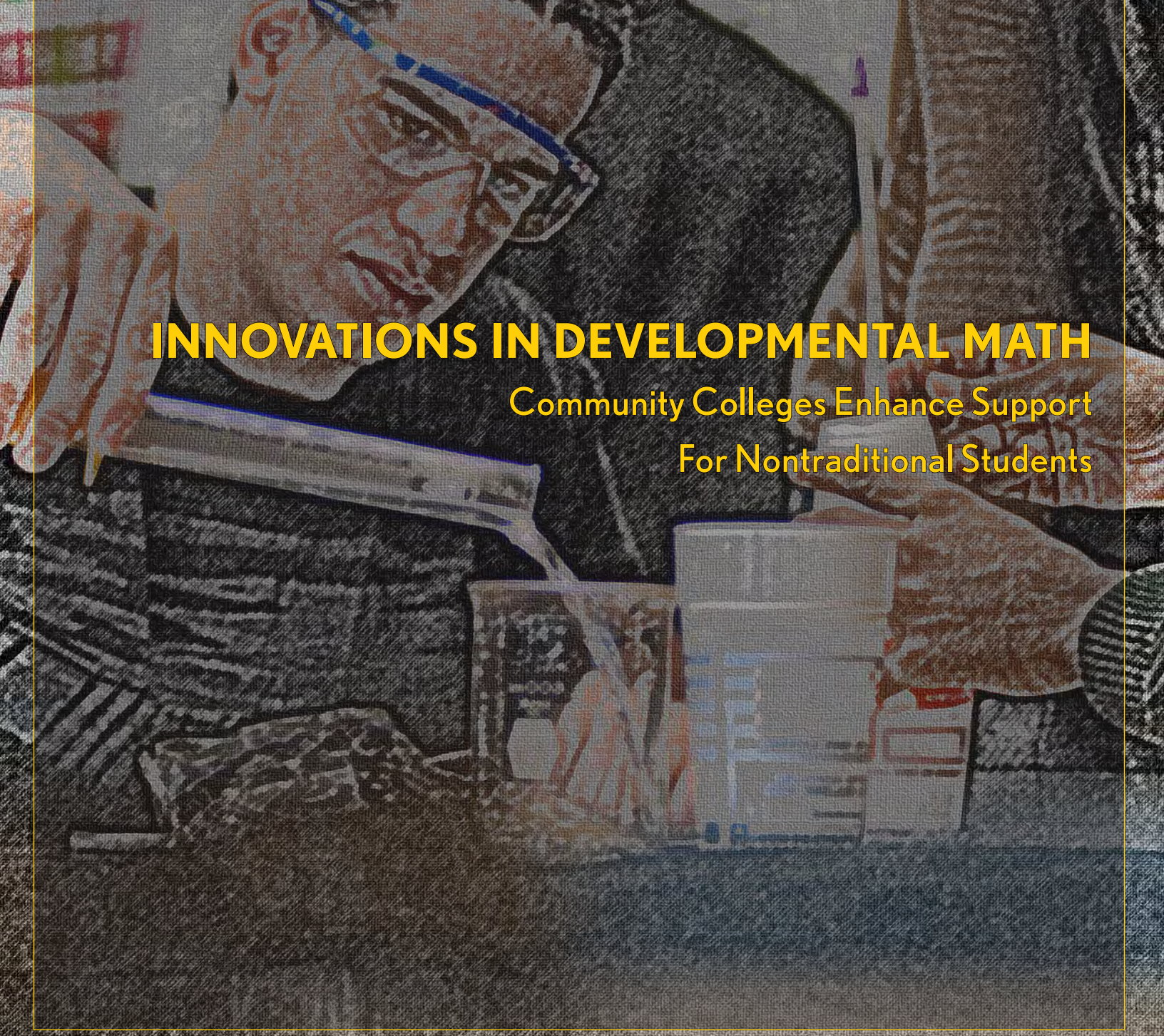

INNOVATIONS IN DEVELOPMENTAL MATH

Community Colleges Enhance Support For Nontraditional Students

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JOBS FOR THE FUTURE

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EXECUTIVE SUMMARY

Nearly 60 percent of incoming community college students are unprepared for college-level work and must take at least one pre-college, "developmental" course, usually in math or English, before enrolling in any credit-bearing classes toward a degree. Within developmental education, students are most likely to need help with mathematics, and students who enter community college needing to take developmental math fare the worst in terms of outcomes making this an issue that deeply affects students.

Lack of readiness for college math is as damaging as it is widespread. Students are more likely to fail developmental mathematics than any other course in higher education, according to the Carnegie Foundation for the Advancement of Teaching. Thus, it is not surprising that many students referred to developmental math choose to bypass such courses and services, without knowing the detrimental consequences of this decision on their overall educational goals.

This brief looks at three community colleges that have made significant investments in programs to improve student success in developmental math. These colleges are spotlighted for their implementation of the varied approaches to developmental math described above and for their ability to demonstrate outcomes for their students.

In 2005, **FLORENCE-DARLINGTON COMMUNITY COLLEGE** in South Carolina redesigned several developmental math courses, implementing a hybrid program that incorporates traditional lectures and the extensive use of technology. Students attend two hours of lecture per week and spend three hours together in the Mathematics and Technology Hub, a new facility with 75 computer workstations. Combining self-paced and guided instruction, Hub courses incorporate online assignments, assessments in the computer lab, and one-to-one communication between students and teachers. Formative assessments identify students' skills and knowledge in various competencies, and software guides students in practicing math skills in which they are weak. During lab time, the course instructor and several tutors provide individual help to the students. Instructors ensure that students meet deadlines by monitoring and adjusting each student's customized math plan.

In Pennsylvania, **DELAWARE COUNTY COMMUNITY COLLEGE'S** participation in the national *Achieving the Dream* initiative led the college to create three student support programs, each targeted toward a specific group of students taking developmental math.

- For its lowest-level students, the college introduced Jump Start Math, a nine-day review of arithmetic and an introduction to college support services at the cost of one credit hour of tuition.
- Students starting with introductory algebra must participate in Mandatory Supplemental Instruction, a program that offers two additional peer-facilitated hours of instruction each week.
- To lessen the need for remediation, the college partners with high schools to help teachers offer developmental math to underprepared high school students. Students who pass the final exam receive a high school math credit and may begin college-level courses as soon as they enroll at DCCC.

After an accreditation review of **CHAFFEY COLLEGE** in California pointed to the large number of students on progress or academic probation and in danger of dismissal, the college devised a comprehensive support system targeting those students and including a new approach developmental math as a component. Opening Doors to Excellence is based on partnerships with instructional departments, student services, and basic skills development, targets students who are one semester from being dismissed from the college. As part of the program, Chaffey created "Success Centers" to improve study, testing, and other support services for students on probation or on the verge of dismissal from the college.

Community colleges can move in these new and promising directions, but to scale them up will require state action. The ability to enable, sustain, and replicate successful developmental math programs at the level of community college systems will require states to be strategic in identifying and enacting supportive public policies on a range of issues, including support for innovations, dissemination of promising models, and financial incentives.

With innovation in developmental math taking off at community colleges, the coming years will be important for overcoming institutional, state, and policy barriers to improving and creating approaches that help more students succeed. These colleges offer compelling examples of effective practices to help more students surmount the barrier of developmental math and get on the path to a college degree.

INTRODUCTION

For a multitude of reasons, community colleges are experiencing record enrollments. More traditional-age college students are choosing to jumpstart their postsecondary education at two-year institutions, both because they are less expensive and because tuition at four-year public institutions continues to rise faster than rates at private institutions.[1] At the same time, increasing numbers of dislocated workers and other adults seeking occupational training and retraining are enrolling at community colleges to improve their skills and better compete in the local labor market.

The American Association of Community Colleges estimates that enrollment in community colleges has risen 17 percent over the last two years and 30 percent increase over five years. Despite this, community college graduation rates have stagnated—under 30 percent nationally (Lee & Rawls 2010). As the numbers of students rise, especially adults returning to the classroom after years in the workforce, community colleges are also finding that the proportion of underprepared students is on the rise.

Developmental education refers to the broad array of services offered to students who are in college but lack the academic preparation to succeed in entry-level courses. It includes remediation, which is a specific sequencing of courses for underprepared students to advance to credit-bearing work. Developmental education can also include academic advising, counseling, college success courses, and other retention programs (Bailey, Jeong, & Cho 2010).[2]

In 2003-04, 29 percent of all community college students were enrolled in development courses (NCES 2008). Nationally, nearly 60 percent of incoming community college students are unprepared for college-level work and must take at least one pre-college, "developmental" course, usually in math or English, before enrolling in any credit-bearing classes toward a degree (Bailey 2009; Attewell et al. 2006).[3]

The sheer number of students requiring developmental education in math or English incurs significant expenses not only for the students who pay tuition but for states and the colleges as well. Although the precise costs of developmental education are unknown, estimates range from $1.2 to $2.3 billion annually for all community colleges and $500 million for public four-year colleges (Collins 2010).[4] For example, in 2009 on top of the $11.7 million Colorado developmental education students paid in tuition, the state invested $13.3 million from its state general fund toward developmental education (Colorado Commission on Higher Education 2010).

Within developmental education, students are most likely to need help with mathematics (Wirt et al. 2004; Bailey, Jeong, & Cho 2010). Students who enter community college needing to take developmental math fare the worst in terms of outcomes making this an issue that deeply affects students. Yet it also provides a catalyst for moving the improvement of developmental education to the forefront of each community college's agenda as it seeks to improve students outcomes and provide career and educational pathways for students.

To achieve this goal, some community colleges are adopting proficiency-based systems for placement in and advancement through developmental math courses. This strategy is designed to enable students to complete courses more quickly, more independently, or in nontraditional settings.[5] Other community colleges are supplementing traditional course structures with case management, intensive extra instruction, and other enhanced support services to help more students pass the developmental course sequence. Still other colleges are collaborating with high schools to improve math achievement and increase the number of students who enter their institutions college ready.

LACK OF PREPAREDNESS FOR COLLEGE-LEVEL MATH

Lack of readiness for college math is as damaging as it is widespread. Students are more likely to fail developmental mathematics than any other course in higher education, according to the Carnegie Foundation for the Advancement of Teaching, which is developing two pathways for developmental math students.[6] Thus, it is not surprising that many students referred to developmental math choose to bypass such courses and services, without knowing the detrimental consequences of this decision on their overall educational goals. Students who hit a roadblock in the lowest levels of developmental math are the most at risk for giving up on ever earning a postsecondary credential.

A recent study of institutions participating in *Achieving the Dream*, a national initiative to improve community college student success, reported that more than half of all students were referred to developmental math, with 19 percent of the students directed to courses three levels below college-level math (Bailey, Jeong, & Cho 2010). It is these students—the ones furthest behind in math—who are least likely ever to advance into classes for college credit. Only 10 percent of this group made it past the sequence of developmental math to complete even one college-level credit-bearing course (*see Table 1*). By contrast, *Achieving the Dream* colleges referred far fewer students (although still a significant number—33 percent of 200,000 individuals) to developmental English (*see Table 1*).

TABLE 1.
DEVELOPMENTAL EDUCATION AND STUDENT SUCCESS: OUTCOMES FOR STUDENTS AT ACHIEVING THE DREAM COLLEGES

	Math (N=239,268 Students)		Reading (N=229,746 Students)	
	Referred to Developmental Math	**Referred to a Developmental Math Course Three Levels Below College Math**	**Referred to Developmental Reading**	**Referred to a Developmental Reading Course Three Levels Below College English**
Total number of students referred	141,590	43,886	78,149	6,825
Percent of students referred	59%	19%	33%	3%
Percent of all students referred who enrolled in developmental education	79%	31%	67%	70%
Percent of students who enrolled in development education who completed the developmental education sequence	33%	17%	46%	29%
Percent of students completing the developmental education sequence who then complete one or more credit-bearing college courses	20%	10%	37%	24%

Source: Bailey, Jeong, & Cho (2010)

EMERGING SOLUTIONS: DELIVERING DEVELOPMENTAL EDUCATION IN NONTRADITIONAL WAYS

For many community college students, the traditional course delivery model—students attend a semester-long lecture class several times per week—does not lead to success in developmental math. Students' academic weaknesses do not divide neatly into 15-week semesters. Many developmental math students failed or never took college-prep math courses in high school; others are older adults returning to the classroom after significant time away from a classroom setting.

As a result, colleges are redesigning course formats to help developmental learners more quickly acquire math skills and transition into credit-bearing programs. Innovative redesign models include accelerated classes, self-directed learning labs, online and other technology-rich learning models, course modules that "chunk" material into manageable parts, and contextualization, the teaching of math with examples and applications from the student's degree focus or career interests. These models serve as possible responses to the developmental math quagmire in which many students and colleges find themselves.

Blending Traditional and Online Instruction. According to a study for the Bill & Melinda Gates and William and Flora Hewlett foundations, innovative programs at community colleges are providing "an initial look at how technology can be used to expand, strengthen, and create efficiencies in the delivery of developmental math practice" (Epper & Baker 2009). This brief highlights how one such program, at Florence-Darlington Technical College in South Carolina, showcases impressive results.

Enhanced Student Support Services. An emerging strategy for improving outcomes is to create systems of support services to help developmental math students as they move through traditionally structured courses. Many of the most successful community college systems target a specific student population, offer ongoing support over an extended period, and blend instructional, programmatic, and student support services (Epper & Baker 2009). These holistic, "whole student" strategies align academic affairs and student affairs, two organizational units that have not historically worked in tandem. This brief describes two particularly successful and replicable approaches, those at Delaware County Community College in Pennsylvania and Chaffey College in California.

Aligning Expectations Across Education Sectors. An increasing number of community college systems are reaching out aggressively to high schools to close the gaps in standards and expectations between high school and postsecondary education. Prominent alignment strategies include the use of college placement exams to assess students earlier in their education and the expansion of dual enrollment and other college-credit-in-high-school options. Proponents of these strategies suggest they can significantly lessen need for developmental education over the long term (*see box, "Two Strategies for Aligning Standards and Expectations Across K-12 and Postsecondary"*). To lessen the need for remediation, the Delaware County Community College partners with high schools to help teachers offer developmental math to underprepared high school students. Students who pass the final exam receive a high school math credit and may begin college-level courses as soon as they enroll at DCCC.

TWO STRATEGIES FOR ALIGNING STANDARDS AND EXPECTATIONS ACROSS K-12 AND POSTSECONDARY EDUCATION

State-level college-readiness initiatives have gained traction in recent years as a viable long-term strategy to reduce the need for developmental courses by students at community colleges. After more than a decade of work to raise standards state by state, 48 states have agreed to adopt a set of national Common Core State Standards.

The Common Core Initiative is set to ramp up the important role of community colleges in ensuring that more high schools graduate students who are ready for college. The initiative, a state-led effort encouraged by the federal government, has set a rigorous definition of college and career readiness in English and math. The high school math standards emphasize mathematical modeling—the practical application of mathematical concepts to real-world issues and challenges.

By establishing standards for college readiness and creating state assessments of high school students benchmarked against those standards, the common core articulates knowledge and skills all high school graduates must possess to ensure a successful transition to higher education. The success of such efforts depends in part on alignment across high schools and postsecondary institutions. Prominent in this group of strategies are two approaches:

Use College Placement Exams to assess students earlier in their education. States are reaching into high schools to test whether students are on track to be ready for college upon graduation.[7] States also are considering options for students to overcome academic deficiencies before enrolling in college. For example, Florida now allows high schools to teach students the first curse in a developmental education curriculum while in high school.

Expand dual enrollment and other college-credit-in-high-school options. States are identifying dual enrollment as a strategy to reduce the need for developmental education. Texas is a national leader in developing policies that promote and support dual enrollment and other early college designs. Its investment in 2006 of a $275 per student allotment for high school students has helped facilitate high school-college collaborations, such as college-credit options for high school students and the establishment of 41 early college high schools (Hoffman & Vargas 2010). El Paso Community College has used dual enrollment/early college as a strategy for decreasing the number of students entering college underprepared. According to a study by the Community College Research Center at Teachers College, Columbia University, dual enrollment students are more likely to enroll in college, have high grade point averages, and persist from year to year in comparison to non-dual enrollment students (Karp et al. 2007).

DEVELOPMENTAL MATH AT FEATURED COMMUNITY COLLEGES

This brief looks at three community colleges that have made significant investments in programs to improve student success in developmental math. These colleges are spotlighted for their implementation of the varied approaches to developmental math described above and for their ability to demonstrate outcomes for their students. (*See Table 2 for background information on the colleges.*)

TABLE 2.
HIGHLIGHTED POSTSECONDARY INSTITUTIONS, FALL 2009

	Florence-Darlington Technical College	Delaware County Community College	Chaffey College
Geographic Type	Rural	Suburban	Suburban
Total Enrollment	5,242	12,237	21,399
Full-time Students	59%	43%	33%
Part-time Students	41%	57%	67%
Students of Color	54%	33%	75%

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System College Data, 2009-2010, available at: http://nces.ed.gov/globallocator/

BLENDING TRADITIONAL AND ONLINE INSTRUCTION

Florence-Darlington Technical College, Florence, South Carolina

Florence-Darlington Technical College was the first South Carolina college to implement online courses and videoconferencing widely. It has also been at the forefront of efforts to boost regional economic development by using innovative technologies and pedagogy. The goal has been to help residents of its service area prepare to compete in a technology- and skill-based economy. With this goal in mind, discussions with students and local employers and an analysis conducted by the college revealed that the greatest barrier to student success in technology-heavy curricula was the failure of students to achieve the math competencies required for getting and succeeding in technology-based jobs. Approximately 70 percent of the college's entering freshmen placed into developmental math courses.

In 2005, Florence-Darlington redesigned several developmental math courses, implementing a hybrid program that incorporates traditional lectures and the extensive use of technology. Students attend two hours of lecture per week and spend three hours together in the Mathematics and Technology Hub, a new facility with 75 computer workstations. Combining self-paced and guided instruction, Hub courses incorporate online assignments, assessments in the computer lab, and one-to-one communication between students and teachers. Formative assessments identify students' skills and knowledge in various competencies, and software guides students in practicing math skills in which they are weak. During lab time, the course instructor and several tutors provide individual help to the students. Instructors ensure that students meet deadlines by monitoring and adjusting each student's customized math plan. Through this personalized approach, instructors teach not only math content but also time management and other skills essential to college success.

The college introduced the Hub courses with two sections of twenty-five students each, and it has since expanded the program to fifteen sections of up to fifty students each. After three and a half years with the Hub program in place, the college calculated that the pass rate of students in hybrid courses was 41 percent higher than that of students in traditional classrooms, well exceeding the college's goal of 5 percent. As a result, Florence-Darlington has moved nearly half of its developmental math courses to the Hub and is redesigning all developmental math courses—as well as some credit-bearing math courses—to follow this format.

Florence-Darlington has invested significant financial and human capital in creating and sustaining the Hub, increasing costs in certain categories and decreasing costs in others. An example of higher costs would be the teaching release time Florence-Darlington's math faculty received (about 1,400 hours) to conduct research, visit colleges, and participate in strategic planning sessions to create the Hub. Additionally, with the expansion of the Math Hub, the college shifted tutorial services there from the Success Center. At that time, the costs for tutors was $100,000 per academic year. The expansion of the Hub has raised that to $185,000 each year. Instructional support equipment acquired for the Math Hub will not add significantly to the replacement and maintenance costs already assumed by the college.

Despite the start-up costs associated with faculty release time and increased tutorial services, other instructional costs have decreased, particularly those associated with the easily sustained integrated methodology. In hybrid sections of developmental math, the number of students in a section has doubled, from 25 to 50. An average of three tutors assist each instructor during the lab component of a hybrid course. Since full-time faculty teach more students per scheduled "section," the need for adjunct faculty decreases. The college estimates that it will save about $63,000 each year in adjunct faculty costs once the Math Hub is fully expanded. Although faculty will teach larger classes, the number of assigned teaching sections will be reduced from six to four.

Although the majority of students in the pre-Baccalaureate program (Associate of Arts and Associate of Science) at Florence-Darlington enroll for transfer credit only, without intending to complete a degree there, Florence-Darlington asserts that students successfully completing the Hub are better prepared for required math courses, and thus, are more likely to persist and continue their studies at the college.

Florence-Darlington's institutional study, *Calculate This! A Quality Enhancement Plan to Improve Student Learning in Remedial and Prerequisite Mathematics*, found that Hub participants have a 66 percent success in their first college-level math course compared to 59 percent for non-participants.[8] The definition of success is a grade of C or better, and the success rate incorporates all students who received letter grades or withdrawal grades.

Florence-Darlington's approach to remediation enables many students to move through required developmental courses faster. Each semester, approximately half of Hub students complete a developmental course early, qualifying them to advance to the next course. Of Hub students taking developmental coursework, approximately 20 percent complete a second course in a semester. With its robust evidence base, Florence-Darlington's Math Hub has created a foundation on which a developmental math best practice, incorporating technology in the design, can alter the pedagogical approaches at community colleges around the country.

Florence-Darlington has experienced other returns on its investment in raising outcomes in developmental math. For example, the college has received funding through a Title III grant from the U.S. Department of Education to further expand the Math Hub to include all pre-curricular mathematics courses, and it engaged in a training partnership with the U.S. Department of Defense. For its teaching faculty and pioneering approach to developmental education, Florence-Darlington has won many awards, including recognition as a Center for Excellence by Pearson Education, which entitles it to an additional $15,000 per year in funding.[9]

TARGETING STUDENT SUPPORTS

Delaware County Community College, Media, Pennsylvania

Developmental math students at Delaware County Community College routinely earned lower grades in compared to students enrolled in developmental reading or developmental English. DCCC's participation in the national *Achieving the Dream* initiative, with its data-driven approach to improving educational outcomes for underserved community college students, led the college to create three student support programs, each targeted toward a specific group of students taking developmental math.

For its lowest-level students, the college introduced Jump Start Math, a nine-day review of arithmetic and an introduction to college support services at the cost of one credit hour of tuition. At the end of the session, students can retake the college's math placement test; if they pass, they jump over the lowest-level course to start introductory algebra, the highest-level developmental class. Students starting with introductory algebra must participate in Mandatory Supplemental Instruction, a program that offers two additional peer-facilitated hours of instruction each week.

In addition, to help prevent the need for remediation, the college partners with high schools to help teachers offer developmental math to underprepared high school students. Students who pass the final exam receive a high school math credit and may begin college-level courses as soon as they enroll at DCCC.

Because Jump Start Math is new, the college has not conducted a cost-benefit analysis of it. However, there is preliminary evidence that Mandatory Supplemental Instruction students taking part in each of these initiatives have better academic outcomes and they progress to credit-bearing courses at a higher rate than non-participants. For example, in spring 2009, 74 percent of students enrolled in the Mandatory Supplemental Instruction pilot passed the course, compared to 64 percent of students in the other sections. In the two summer 2009 pilot sections of Jump Start math, 100 percent of the students completed the review, and all of those with the prerequisite skills placed into introductory algebra and higher. In the high school initiative, all of the students from the initial pilot passed the final exam and were eligible to take college-level math.

Some benefits to students are quantifiable and immediate. For example, students enrolled in Jump Start Math pay for only one credit hour and receive the textbook at no cost, as opposed to paying for Delaware County's basic three credit-hour math course (MAT 40 course) and textbooks. Mandatory Supplemental Instruction students also take part in two additional 50-minute instructional sessions at no cost (*see Tables 3 and 4*).

TABLE 3.
STUDENT COSTS ASSOCIATED WITH DELAWARE COUNTY COMMUNITY COLLEGE'S JUMP START MATH, FALL 2009

Student Status	Tuition	Plant Fee	Student Activity Fee	Instructional Support Fee	Total
Residents of Sponsoring School Districts	$97	$0	$2	$32	$131
Pennsylvanians Residing in Non-Sponsoring District	$194	$3	$2	$32	$231
Out-of-State Residents	$291	$6	$2	$32	$332
International Students (excluding permanent residents of Pennsylvania)	$326	$6	$2	$32	$366

Source: Provided by the Director of Supplemental Learning Programs, Delaware County Community College, August 9, 2010

Note: Instructional support fees are charged to support the cost of technology or unusual staffing, supply, or facility costs associated with the course. Credit-bearing courses are $32 per credit hour. Plant fees are charged for students who do not reside in a school district that financially sponsors DCCC. The plant fee is $3 per credit hour for non-sponsors who live in Pennsylvania and $6 per credit hour for out-of-state students. The student activity fee is $2 per credit hour.

TABLE 4.
STUDENT COSTS ASSOCIATED WITH DELAWARE COUNTY COMMUNITY COLLEGE'S MAT 40 MATH COURSE, FALL 2009

Student Status	Tuition	Plant Fee	Student Activity Fee	Instructional Support Fee	Total
Residents of Sponsoring School Districts	$291	$0	$6	$96	$500
Pennsylvanians Residing in Non-Sponsoring District	$582	$9	$6	$96	$800
Out-of-State Residents	$873	$18	$6	$96	$1,100
International Students (excluding permanent residents of Pennsylvania)	$978	$18	$46	$96	$1,205

Source: Provided by the Director of Supplemental Learning Programs, Delaware County Community College, August 9, 2010

DEVELOPING COMPREHENSIVE SUPPORTS FOR ALL AT-RISK STUDENTS

Chaffey College, Rancho Cucamonga, California

In 2004, an accreditation review of Chaffey College pointed to the large number of students on progress or academic probation and in danger of dismissal. A Chaffey student goes on progress probation when he or she has attempted a total of over 12 units and 50 percent of more of those units end in withdrawals, incompletes, or non-progress grades. Academic probation occurs when the total number of attempted units is over 12 and the cumulative grade point average is below 2.0. At the time of the review, one in five Chaffee students was on probation, and the number was rising.

As a result, the college devised a comprehensive support system targeting those students and including a new approach developmental math as a component. Chaffee piloted the resulting Opening Doors program in fall 2005, with refinements and beta testing in 2005 and 2006. The college adopted the final version, Opening Doors to Excellence, in 2007. The program, which is based on partnerships with instructional departments, student services, and basic skills development, targets students who are one semester from being dismissed from the college. ODE participants sign a contract agreeing to: repeat specific courses that will help them improve their GPA; not drop classes without consulting a program counselor; and meet with their counselor to develop a one-year educational plan to regain good standing.

As part of Opening Doors to Excellence, Chaffey created "Success Centers" to improve study, testing, and other support services for students on probation or on the verge of dismissal from the college. Each Success Center is devoted to a particular discipline and infused with a "counseling apprentice" component. Counselor apprentice provide mentoring, and academic supports through tutoring and leading study groups. Each ODE participant must visit the centers at least six times in their first semester in the program, once for an orientation during the first week of classes, with subsequent visits during pre-scheduled time periods over the course of the semester. In the second term of ODE, students enroll in Opening Doors to Student Effectiveness, a course focused on empowering them to become active, responsible learners. Along with this course, students must complete five directed-learning activities at the Success Centers, with each activity correlated with one or more topics covered in the class.

The Math Success Center, in particular, covers test preparation and teaches students about math anxiety. Guidance counselors use a computerized early alert program to identify and notify students who are experiencing academic difficulty, and they then make recommendations for improvement. Counselor apprentices make follow-up calls to encourage students to address the instructors' recommendations. Participating students are immune from dismissal for one year, giving them time and opportunities to improve their performance.

Since its inception in fall 2005, the Student Success Centers have served 2,220 students. A 2009 evaluation study of programs offered at Chaffey's Success Centers, conducted in collaboration with MDRC, randomly assigned Chaffey students to one of three programs: a voluntary Opening Doors program (designed as a one-semester voluntary program), the Enhanced Opening Doors Program (designed as a mandatory two-semester program with a requirement that students complete a college success course), and students with a traditional college services and supports. MDRC found that 36 percent of students in the Enhanced Opening Doors Program—the program in the evaluation most similar to the one implemented at Chaffey—earned a GPA of 2.0 or higher, compared to 24 percent of the control group.[10] In addition, 30 percent of the program group regained good standing after two semesters, compared to 16 percent of the control group.

Since Chaffey institutionalized Opening Doors to Excellence, the number of students dismissed has steadily decreased. In spring 2009, less than 3 percent of the student population was dismissed, compared to 5 percent two years earlier. Chaffey reports that ODE students have higher retention rates and lower levels of dismissal or additional semesters of probation compared to non-participations. According to the college's Institutional Research office, the Success Centers and ODE demonstrate higher rates of success for African-American and Latino males, two extremely at-risk populations.

Chaffey uses data not only to monitor progress but also to improve its programs. For example, in 2008 the success of ODE aided in the development of the Smart Start program, a voluntary program for new students identified as needing additional supports during the initial college assessment process.[11]

SCALING UP SUCCESS: IMPLICATIONS FOR STATE POLICY

Given that community colleges open the doors of opportunity to working adults and underserved populations, it is not surprising these institutions have been on the forefront of innovation related to the delivery of developmental math curricula. The institutions highlighted in this brief have piloted innovative programmatic approaches and practices to improve student outcomes at their respective schools. Chaffey College and Florence-Darlington Technical College both implemented institution-led efforts, while Delaware County College undertook Jump Start Math as part of a national project to help more students succeed and earn credentials.

Colleges can move in these new and promising directions, but to scale them up will require state action. The ability to enable, sustain, and replicate successful developmental math programs at the level of community college systems will require states to be strategic in identifying and enacting supportive public policies on a range of issues, including support for innovations, dissemination of promising models, and financial incentives.

Some states have made strides in enabling community colleges to experiment with alternative methods of delivering developmental curriculum, including math. For example, since 2006, the Texas Higher Education Coordinating Board has made it a priority to deliver innovative and effective developmental education programming. The Coordinating Board set aside $3 million for developmental education research and innovation, which it distributed in 2006 to 13 institutions across the state. This initiative, run in partnership with the National Center for Academic Transformation, funded the redesign of curricula to incorporate technologies and projects experimenting with concurrently enrolling students in credit-bearing and non-credit bearing courses. The board continues to request additional funds from the state legislature to continue its support of the state's agenda for improving student postsecondary outcomes (Collins 2009).

With innovation in developmental math taking off at community colleges, the coming years will be important for overcoming institutional, state, and policy barriers to improving and creating approaches that help more students succeed. These colleges offer compelling examples of effective practices to help more students surmount the barrier of developmental math and get on the path to a college degree.

In the immediate future, states will need to investigate promising practices and strategies that will reduce the number of students requiring remediation. A framework created by Jobs for the Future for the national Developmental Education Initiative can serve as a resource for states that wish to improve the number of students who successfully complete developmental education and transition to credit-bearing curricula (JFF 2010). To inform the field, states will find it important to answer the following questions:

- Does the state have the ability to effectively communicate with community colleges around this issue? If not, what systems need to be in place to promote conversations?
- What strategies has the state adopted to align expectations across K-12 and postsecondary education?
- How does the state encourage further innovation?
- Does the state have a data system and ability to use analysis to entice the colleges to plan and implement nontraditional strategies for developmental education students?
- What barriers must the state address to encourage innovation in developmental education (e.g., performance funding, less diagnostic assessments, and placement policy)?
- Are there colleges in the state already engaged in the Developmental Education Initiative work?

To improve student outcomes in developmental math, as well as all of developmental education, a state must commit to addressing these questions. The answers will provide a broad-based framework to encourage and strengthen efforts at the institutional level.

ENDNOTES

[1] See the College Board for more information on higher education pricing trends, http://www.collegeboard.com/press/releases/208962.html.

[2] The term "developmental education" in this brief refers to the broader concept of instruction and support. This avoids the negative connotations often associated with the term "remedial."

[3] These data are based on the National Educational Longitudinal Study, which reports on the enrollment of traditional school-age students in developmental education courses. The actual percentage of students enrolled in developmental courses at community colleges is likely higher, given that community colleges enroll older students returning to community colleges from the workforce.

[4] See Fulton (2010) for a review of the literature on how states report the costs of delivering developmental education course.

[5] See Biswas (2007) for more information on acceleration strategies, institutional innovation, and state policy.

[6] For more information on these pathways—Mathway and Statway (the Statistics Pathway)—see: http://www.carnegiefoundation.org/problem-solving/developmental-math

[7] For more information on the state assessment policy and developmental education, see http://www.jff.org/publications/education/it's-not-about-cut-score-redesigning-pla/209

[8] See www.fdtc.edu/academics/CalculateThisNarrativeMaster.doc

[9] In recognition of its commitment to success for its developmental math students, Florence-Darling was a finalist for the 2010 MetLife Foundation Community College Excellence Award in the category of Service to Students.

[10] For more information on MDRC's report on the Chaffey initiative, see http://www.mdrc.org/publications/514/overview.html

[11] Chaffey College was the winner of the 2010 MetLife Foundation Community College Award in the category of Service to Students through its Open Doors to Excellence program.

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