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Student Progression Through Developmental Sequences in Community Colleges

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Developmental education is designed to provide students with weak academic skills the opportunity to strengthen those skills enough to prepare them for college-level coursework. The concept is simple enough—students who arrive unprepared for college are provided instruction to bring them up to an adequate level. But in practice, developmental education (or "remedial" education, we use these terms interchangeably) is complex and confusing. Experts do not agree on the meaning of being "college ready," and policies governing assessment, placement, pedagogy, staffing, completion, and eligibility for enrollment in college-level, credit-bearing courses vary from state to state, college to college, and program to program. The developmental education process is confusing enough simply to describe, yet from the point of view of the student, especially one with very weak academic skills and little previous success in school, it may appear as a bewildering set of unanticipated obstacles involving several assessments, classes in more than one subject area, and sequences of courses requiring three or more semesters of study before the student (often a high school graduate) is judged prepared for college-level work.

The policy deliberation and especially the research about developmental education give scant attention to this confusion and complexity. Discussion typically assumes that the state of being "college ready" is well-defined, and it often elides the distinction between students who need remediation and those who actually enroll in developmental courses. What is more, developmental education is often discussed without acknowledgement of the extensive diversity of services that bear that label. Any comprehensive understanding of developmental education and any successful strategy to improve its effectiveness cannot be built on such a simplistic view.

In this Brief, which summarizes a study by the Community College Research Center on patterns of student progression through developmental education, we broaden the discussion by moving beyond consideration of the developmental *course* and focus attention instead on the developmental *sequence*. In most colleges, students are, upon initial enrollment, assigned to different levels of developmental education on the basis of performance on placement tests. Students with greater academic deficiencies are often referred to a sequence of three or more courses designed to prepare them in a step-by-step fashion for the first college-level course in a particular subject area. For example, students with the greatest need in developmental math may be expected to enroll in and pass pre-collegiate math or arithmetic, basic algebra, and intermediate algebra in order to prepare them for college-level algebra.

We define the "sequence" as a process that begins with initial assessment and referral to remediation and ends with completion of the highest-level developmental course—the course that in principle completes the student's preparation for college-level studies. At times we extend the notion of "sequence" into the first-level college course in the relevant subject area—known as the "gatekeeper" course—since in the end the short-term purpose of remediation is to prepare the student to be successful in that first college-level course. In this study we examine the relationship between referral to developmental education and actual enrollment, and we track students as they progress or fail to progress through their referred sequences of remedial courses, analyzing the points at which they exit those sequences. We also analyze demographic and institutional characteristics that may be related to student progression in developmental sequences.

We carry out this analysis using longitudinal data collected as part of the Achieving the Dream: Community Colleges Count initiative (see www.achievingthedream.org). The sample includes data on more than 250,000 students from 57 colleges in seven states. This Achieving the Dream sample more closely represents an urban, low-income, and minority student population than do community colleges in the country as a whole. Because the sample is not representative of all community college students, we checked our results—when possible—

against an analysis we conducted using the National Education Longitudinal Study of 1988, a nationally representative sample of traditional college-aged students (they were all in eighth grade in 1988 and were followed until 2000). Results of that analysis, which are discussed in the full study report on which this Brief is based, are consistent with results derived from the Achieving the Dream dataset.

Data from Achieving the Dream

Achieving the Dream: Community Colleges Count is a multiyear, national initiative designed to help community college students succeed, particularly low-income students and students of color. Launched in 2004 with funding provided by Lumina Foundation for Education, more than 130 colleges in 24 states currently participate in the initiative. One of its most important goals is helping participating colleges and accompanying state agencies to build "a culture of evidence"— to gather, analyze, and make better use of data to foster fundamental change in the education practices and operations of community colleges for the purpose of improving student outcomes. The Achieving the Dream initiative collects longitudinal records for all first-time credential-seeking students in specified cohorts at all of the colleges participating in the initiative, including data on cohorts starting two years before the college entered the initiative. These cohorts will be tracked for the life of the initiative (at least six years for participating colleges) and possibly beyond.

The dataset we used in this study was derived from records of 256,672 first-time credential-seeking students who began their enrollment in fall 2003 or fall 2004 at one of the 57 Achieving the Dream colleges that provided detailed information on developmental education. We followed their enrollments for three academic years—through the summers of 2006 and 2007, respectively. For simplicity, we focused on two common developmental education subjects: math and reading. The dataset contains information on student gender, race/ethnicity, age at entry, full- or part-time status, major, remedial courses taken and the grades earned in those courses, and enrollment in and completion of gatekeeper courses. One unique aspect of this dataset, particularly important for our purposes, is that it includes a variable indicating whether students were referred to developmental education and, for those who were referred, the level to which they were referred.

Findings

Placement in Developmental Education

Most Achieving the Dream colleges use an assessment test and/or academic records to place beginning students into developmental education. Based on their performance on the test/records, many individuals are referred to a sequence of developmental courses. Different colleges provide different numbers of course levels in developmental education subject areas. In fall 2000, public two-year colleges nationwide reported to offer, on average, 3.6 remedial courses in math and 2.7 remedial courses in reading. Among the 53 Achieving the Dream colleges in the sample that provided information on remedial math offerings, 35 offer three or more levels of remedial math, 9 offer two levels, and 9 offer one level. Among the 51 such colleges that provided information on remedial reading offerings, 20 offer three or more levels of remedial reading, 20 offer two levels, and 11 offer one level.

The Achieving the Dream database classifies all beginning college students into four groups for each developmental education subject area: students referred to 1) no developmental education, 2) developmental education one level below the entry college-level course, 3) developmental education two levels below college-level, and 4) developmental education three or more levels below college-level. It is thus possible to identify the distribution of students referred to different levels of developmental education by subject. Fifty-nine percent of students in the sample were referred to developmental math: 24 percent to one level below college-level, 16 percent to two levels below, and 19 percent to three or more levels below. Far fewer students—only 33 percent—were referred to developmental reading: 23 percent to one level below, 7 percent to two levels below, and 3 percent to three or more levels below.

Progression in Developmental Education

In principle, only those students who pass the developmental course to which they were originally referred can pursue the next higher developmental or college-level course in a given subject area. In reality, many students enroll in higher and even lower level courses than those to which they are referred, or they skip courses in the developmental sequence. Some referred students skip remediation entirely and enroll directly in the first college-level course in the relevant subject area.

Overall in our Achieving the Dream sample, 33 percent of students referred to math remediation and 46 percent of those referred to reading remediation completed their sequences of developmental education. Students who passed the highest level developmental course in their referred sequence are defined as sequence completers (see Table 1). Not surprisingly, developmental education completion rates are negatively related to the number of levels to which a student is referred. Of those students who were referred to remediation at one level below

Table 1:
Enrollment in and Completion of Developmental Sequences

Developmental course level (below college-level) to which student was referred	Student Progression				Total (N)
	Never enrolled in a developmental education course of any kind	Did not complete sequence, but never failed or withdrew from a course[1]	Did not complete sequence: failed or withdrew from a course	Completed sequence	
Math					
1 level below	37%	2%	17%	45%	59,551
2 levels below	24%	13%	32%	32%	38,153
3+ levels below	17%	23%	44%	17%	43,886
Total	27%	11%	29%	33%	141,590
Reading					
1 level below	33%	5%	12%	50%	54,341
2 levels below	21%	13%	24%	42%	16,983
3+ levels below	27%	19%	25%	29%	6,825
Total	30%	8%	16%	46%	78,149

[1]The small percentage of those who were referred to one level below college-level and who never failed a course yet did not complete their sequence are likely to have enrolled in a lower level of remediation, passed that course, and left the system.

college-level, 45 percent and 50 percent completed developmental math and reading, respectively. (For simplicity in our analysis, individuals in need of remediation at colleges having only one level of remediation in a given subject area were treated the same as those individuals in need of remediation one level below college-level at institutions having two or three or more developmental levels.) Of those referred to two levels below college-level, only 32 percent and 42 percent completed their two-course sequences in math and reading remediation, respectively. The corresponding figures are 17 percent and 29 percent for those referred to three or more levels below college-level.

Many of the students who failed to complete their developmental sequence did so because they never enrolled in a developmental course to begin with. Just under one third of all students referred to remediation in this sample did not enroll in any developmental course in the relevant subject area within three years. Of those students who did enroll in a remediation course, many—29 percent of all students referred to math and 16 percent of those referred to reading—exited their sequences after failing or withdrawing from one of their courses. But a substantial number—11 percent for math and 8 percent for reading—exited their sequence never having failed a course. That is, they successfully completed one or more developmental courses but did not enroll in the next course in their sequence. Thus if one combines the number of students who never enrolled with those who exited between courses, more students did not complete their sequences because they did not enroll in the first or a subsequent course than because they failed a course. For example, for reading, 30 percent never enrolled, and 8 percent left between courses, while only 16 percent failed or withdrew from a course.

Gatekeeper Enrollment and Completion

The goal of developmental education is to prepare students for college-level courses. Data displayed in Table 2 show how developmental sequence completers fared in their first college-level, or gatekeeper, course. Between 50 and 55 percent of sequence completers also completed the gatekeeper course. But to complete the gatekeeper course, a student must first enroll in and then pass that course. About two thirds of the sequence completers enrolled in the gatekeeper course, and about three quarters of those who enrolled in it passed, so once again, as was the case with developmental education completion, failure to enroll is a greater barrier than course failure or withdrawal.

The high pass rate is encouraging, but developmental education completers are already a select group of students who have already successfully navigated their often complicated sequences. When considered from the beginning of the sequence, only 20 percent of students referred to math remediation and 37 percent of those referred to reading remediation completed a gatekeeper course in the relevant subject area within three years.

As we have seen, many of those referred to developmental education never enroll in their first remedial course: more than one quarter of referred students in our sample never enrolled in a

developmental education course of any kind (see Table 1). Table 3 presents data on what happened to those students. Such students do not necessarily leave college. In some colleges or states, remediation is not mandatory, and in most colleges, students may take courses in subjects for which the remedial course to which they were referred is not a prerequisite. It may also be the case that some students, perhaps with the collaboration of some faculty or counselors, simply do not comply with the regulations (Perin & Charron, 2006).

Many students in our sample ignored the advice (or instructions) of the placement and referral system and skipped their developmental sequence, enrolling directly in a gatekeeper course in the subject area for which they were presumably in need of remediation. Among those students who never enrolled in remediation, about 17 percent of students referred to math remediation and 45 percent of those referred to reading remediation enrolled directly in a gatekeeper course. These students passed their gatekeeper courses at a slightly lower rate than those students who enrolled in a gatekeeper course after they completed their developmental sequences. But many students who comply with their developmental placement never reach a gatekeeper course. Perhaps a more revealing analysis would compare the probability of completing a gatekeeper course for referred students who enter that college-level course directly to that probability for those who follow the recommendations of the counseling system and enroll in the developmental course to which they are referred. About 72 percent of those who went directly to the college-level course passed that course, while only about 27 percent of those who complied with their referral completed the college-level course (not shown in tables).

It appears that the students in this sample who ignored the advice of their counselors and proceeded directly to college-level courses made wise decisions. One interpretation of this finding is that the developmental education obstacle course creates barriers to student progress that outweigh the benefits of the additional learning that might accrue to those who enroll in remediation. This is at least consistent with research (see full report) suggesting that remedial services do little to increase the chances that a student will be successful in their first college-level course. An alternative explanation is that these students have a better sense of their skills compared with what counselors can test for with widely used assessments.

For other students, especially for those referred to math remediation, non-enrollment was related to more negative effects. Of those students referred to math remediation who never enrolled, only 61 percent enrolled in another course and 42 percent never earned a college credit in three years after their first term.

Any multiple-step sequence of courses presents many possibilities for pathways through that sequence. Students can skip courses or move backward, and of course they can pass or fail, and move on or fail to move on to subsequent courses. For example, taking the nearly 44,000 students in our sample who were referred to math remediation at three or more levels below college-level, we counted 75 different pathways used by at least one student

Table 2:
Enrollment in and Completion of Gatekeeper Courses
Among Students Who Enrolled in and Completed Developmental Education

	Students Who Enrolled in Developmental Education				
			Among Developmental Education Completers		
Developmental course level (below college-level) to which student was referred	Developmental enrollment rate (in any course in that subject) among those referred	Gatekeeper pass rate among those referred	Gatekeeper pass rate	Gatekeeper enrollment rate	Pass rate among those who enrolled in gatekeeper course
Math					
1 level below	76%	27%	48%	61%	78%
2 levels below	78%	20%	53%	66%	81%
3+ levels below	83%	10%	53%	68%	78%
Total	79%	20%	50%	63%	79%
Reading					
1 level below	64%	42%	56%	73%	75%
2 levels below	78%	29%	52%	68%	75%
3+ levels below	70%	24%	55%	71%	78%
Total	67%	37%	55%	72%	75%

each through (or more likely not through) the developmental maze.

Characteristics Related to Developmental Progression

Our analysis has shown that many students in the sample did not complete their developmental sequences. But there is considerable variation in these outcomes among students who were referred to the same level of remediation. Can we identify student or institutional characteristics that are related to a higher likelihood of progressing in a developmental sequence?

To address this question, we supplemented the individual-level data from the Achieving the Dream dataset with institution-level data from Achieving the Dream and from the Integrated Postsecondary Education Data System (IPEDS) to conduct a multivariate analysis. The methodology and more detailed results are discussed in the full report of the study. The analysis, which was exploratory and not definitive, allowed us to examine relationships between individual and institutional factors and student progression through developmental education.

We found that men, part-time students, and individuals studying in vocational areas had lower odds of passing to a higher level in a developmental sequence than did women, full-time students, and non-vocational students, respectively. The gender effect and the part-time/full-time status effect were found to be strong throughout the entire set of sequences for both math and reading (the odds for women were 1.5 to 1.8 times as high as those for men; the odds for full-time students were 1.5 to 1.7 times as high as those for part-timers). We also found that when referred to developmental math at two or at three or more levels below college-level, Black students had lower odds than White students of passing to a higher level (the odds were 0.75 and 0.67 times as high, respectively). Older students referred to any sequence of reading remediation and to the one-course sequence of math remediation were found to have lower odds of progressing than younger students. Finally, we found that for those students referred to math remediation at three or more levels below college-level, also having weak reading skills was problematic for passing to a higher level in math.

Our analysis also suggests that institution-level variables—in particular, college size and certificate orientation—may be important for developmental progression even after adjusting for individual demographic characteristics. We found that the odds of passing to a higher level in a developmental sequence tended to be lower when students attended small colleges and when they attended certificate-oriented colleges, but in most cases these results were not statistically significant.

Discussion and Conclusion

Fewer than one half of students in our sample completed their developmental sequences, and only 20 percent of students referred to math remediation and 37 percent of those referred to reading remediation completed a gatekeeper course in the relevant subject area within three years.

In addition to providing evidence on overall developmental completion rates, this study has presented information about the nature of developmental course sequences and the places where students tend to exit their sequences. Analysis

Table 3:
Enrollment in and Completion of Gatekeeper Courses Among Students Who Did Not Enroll in Developmental Education

Developmental course level (below college-level) to which student was referred	Never enrolled in a developmental course in that subject	Gatekeeper enrollment rate	Gatekeeper pass rate	Enrolled in another course within three years	No credits obtained after first term	Number of students who did not enroll in a developmental course in that subject (N)
Math						
1 level below	24%	24%	18%	64%	38%	14,045
2 levels below	22%	14%	10%	62%	42%	8,338
3+ levels below	17%	6%	4%	54%	51%	7,439
Total	21%	17%	12%	61%	42%	29,822
Reading						
1 level below	36%	50%	36%	71%	36%	19,375
2 levels below	22%	29%	21%	61%	44%	3,800
3+ levels below	30%	26%	17%	59%	49%	2,059
Total	33%	45%	32%	68%	38%	25,234

of developmental sequences makes clear that many students who exit their sequence do so even though they have never failed or withdrawn from a developmental course. This pattern extends into the first college-level course: Among developmental completers in the sample, those who enrolled in a gatekeeper course had a good chance of passing it, but about 30 percent did not enroll in such a course within the three-year period of the study.

This study has also revealed the confusion and disarray that underlies the apparent orderliness of the developmental sequence. In theory, the system consists of an ordered set of courses into which students are placed with the assistance of assessments used by hundreds of thousands of students. But barely a majority of students actually follow their referral recommendations by enrolling at the course level to which they were referred (not shown in tables). For some students who forgo remediation entirely, deviation from the referral appears to be a wise decision, but others ignore the recommendations and disappear from the college altogether. And those who do enroll in remedial courses take a bewildering variety of pathways as they try to make progress toward college-level courses.

Given the confusion and ineffectiveness of the developmental system, one possible objective would be to reduce the length of time before a student can start college courses—to accelerate the remediation process. A system using more accurate assessment that identifies the specific needs of students and focuses instruction on addressing those particular needs would be one way to minimize the time a student spends in remediation. It may be possible to provide that supplemental instruction, through tutoring for example, while the student is enrolled in an introductory college-level course. We have seen that students who choose to skip remediation do reasonably well. It might make sense to provide appropriate support so that more students could follow that path.

We have emphasized that more students fail to complete developmental sequences because they never enroll in their first or a subsequent course than because they drop out of or fail to pass a course in which they are enrolled. This insight suggests a wide variety of possible approaches. Perhaps colleges should combine two or three levels of instruction into one longer, more intensive, accelerated course. At the very least, concerted efforts should be made to encourage students who complete one course in their sequence to go on to the next. This might involve abandoning the semester schedule to prevent gaps between courses, or registering and scheduling students for the next course in a sequence while they are still in the previous course.

As it stands now, developmental education sequences may appear confusing, intimidating, and boring to many students entering community colleges. And so far, developmental education has at best shown limited success. But if the nation is to increase its college-educated workforce, it will have to do so by strengthening the skills of the millions of students in community college developmental programs. That progress can only be made if we understand, simplify, and improve the complex developmental sequences that confront so many students.

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