

**Promoting Gatekeeper Course Success  
Among Community College Students Needing Remediation**

**Findings and Recommendations from a Virginia Study  
(Summary Report)**

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## **Introduction and Overview**

This report summarizes key findings and recommendations from a Community College Research Center (CCRC) study designed to help community colleges develop strategies for improving the rate at which academically underprepared students take and pass initial college-level (or “gatekeeper”) courses in math and English. CCRC conducted the study at the request of the Virginia Community College System (VCCS) to inform the system’s strategic objective of improving retention and academic success for their students, particularly the large number of students who arrive unprepared for college-level work. The study examined student characteristics, course-taking patterns, and other factors associated with higher probabilities that students who require remediation will take and pass math and English gatekeeper courses.

A detailed report on the study (Roksa, Jenkins, Jaggars, Zeidenberg, & Cho, 2009) is available on the CCRC website. Although the study was based on an analysis of students in Virginia’s community colleges, the patterns of and reasons for student success in gatekeeper courses may well be common to many community colleges. Moreover, the analyses CCRC conducted as part of the study might serve as useful models for other colleges and state systems interested in analyzing patterns of progression and success. This paper is intended to stimulate discussion and inquiry among community college educators seeking to improve degree completion rates for the many students who come to them poorly prepared to succeed in college-level work.

## **Research Methods**

The dataset used by CCRC was provided by VCCS and contained information on a cohort of 24,140 first-time college students who enrolled in a VCCS college in the summer or fall 2004 terms. It included information on student demographics, institutions attended, placement test scores, and placement recommendations; transcript data on courses and grades; and information on educational attainment (including transferring to four-year institutions and earning certificates and associate degrees). Students were followed for four years, through the 2008 summer term. CCRC examined a range of educational outcomes for this cohort, including: whether students took and passed developmental courses and gatekeeper English and math, the number of terms students were enrolled, the number of credits they accumulated, and whether they earned educational awards (certificates and associate degrees) or transferred to a four-year institution.

CCRC’s analyses focused in particular on educational progression of students who were in need of developmental education. We used three different indicators of the need for developmental education: students’ placement test scores; course placement recommendations; and whether or not students took developmental courses in reading, writing, or math. While the three markers were correlated, their correspondence was far from perfect; each provided different insights into students’ educational pathways and outcomes. The full report (Roksa et al., 2009) presents results separately by each of these indicators, and it discusses in detail the extent and implications of missing data issues that were observed for

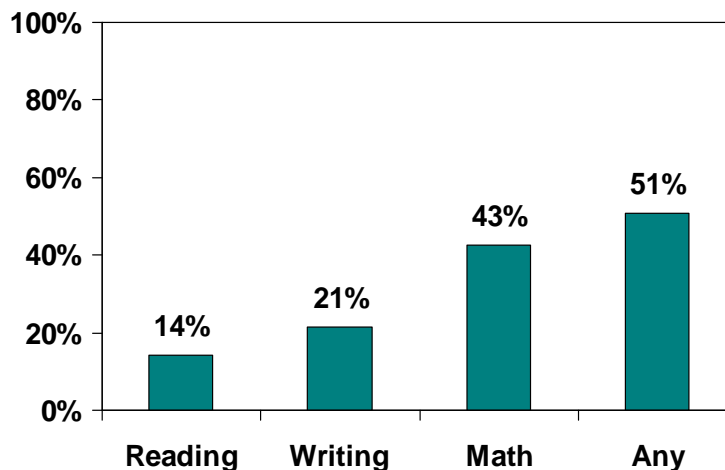
test scores and placement recommendations. In this summary, we highlight the key findings from the more detailed analyses.

### Findings

**Finding:** *Half of the cohort enrolled in at least one developmental course, yet over one third of those recommended to developmental education in a given subject did not take any developmental courses in that subject.*

Half of the summer/fall 2004 entering cohort enrolled in at least one developmental education course. As is evident from Figure 1, the rate of developmental enrollment was particularly high in math, with 43 percent of students taking at least one developmental course in that subject. Smaller proportions of students took developmental courses in writing (21 percent) or reading (14 percent). A similar pattern of enrollment in developmental education (highest for math, followed by writing and then reading) was evident for students in transfer and career tech programs, and for students who did and did not earn dual enrollment credits during high school. However, transfer program students enrolled in developmental math at a higher rate than career-technical students, perhaps due to program requirements. In addition, the 9 percent of students who earned dual enrollment credits during high school seemed more academically prepared: only 37 percent enrolled in developmental courses, compared with 52 percent of students without dual enrollment credits.

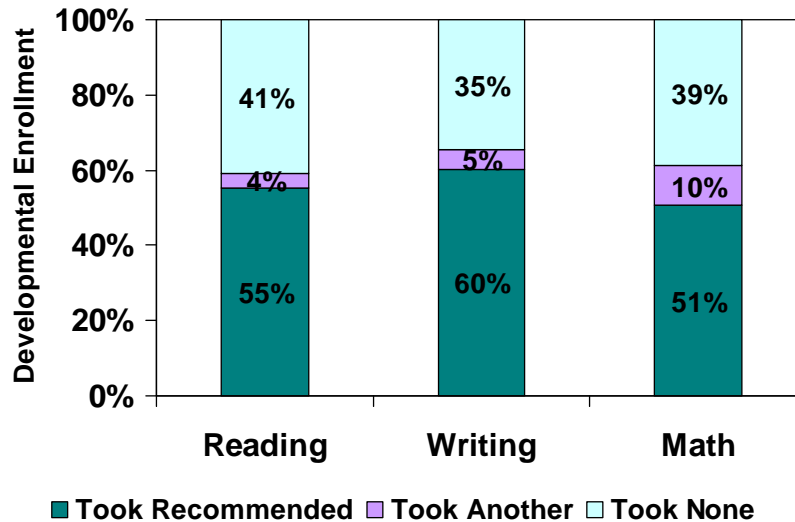
**Figure 1: Enrollment in Developmental Courses**



However, as shown in Figure 2, only about 50 to 60 percent of students referred to developmental education took the same developmental course to which they were recommended. While some students took a developmental course other than the one

recommended, over a third did not take any developmental course in the recommended subject. Thirty-nine percent of students who were recommended to take a developmental math course did not do so. Similarly, 35 percent of students who were recommended to take a developmental writing course and 41 percent who were recommended to take a developmental reading course did not take any developmental courses in those subject areas.

**Figure 2: Enrollment in Developmental Courses by Placement Recommendation**

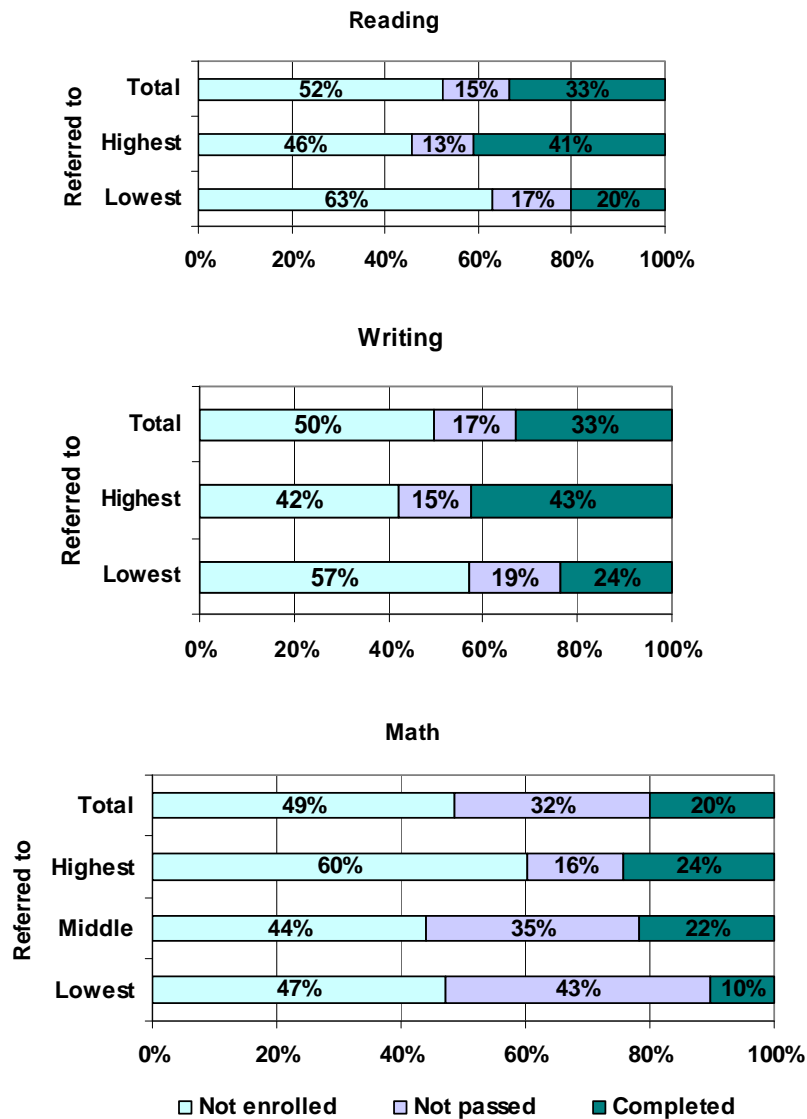


**Finding:** *Most students did not complete the recommended developmental sequence, both because they did not enroll in recommended courses and, to a lesser extent, because they did not pass the developmental courses that they took.*

Figure 3 shows the rate at which students who placed into transfer programs completed the full sequence of developmental courses in a given subject, with each bar representing students referred to a particular level of developmental coursework in that subject. Most community colleges in Virginia offer three levels of developmental math (labeled “highest,” “middle,” and “lowest”), and two levels of developmental reading and writing (labeled “highest” and “lowest”). The majority of transfer-placed students did not complete the recommended developmental sequence, both because they did not enroll in recommended courses and, to a lesser extent, because they did not pass the developmental courses they took. Students referred to the lowest levels of developmental instruction fared particularly poorly. For example, among students referred to the lowest level of developmental math, 47 percent did not enroll in any developmental math course; 43 percent enrolled in one or more developmental math courses but did not pass one of those courses, thereby never completing the sequence; and only 10 percent successfully completed the developmental sequence. In contrast, among students referred to the highest level of developmental mathematics (who required only one course to complete the sequence), 60 percent did not enroll in the required

course; 16 percent enrolled, but did not pass the course; and 24 percent completed the course. At all levels and in every subject, transfer-placed students did not complete the developmental sequence largely because they did not enroll in the recommended courses, not because they did not pass the developmental courses they enrolled in.

**Figure 3: Developmental Enrollment *and* Performance\***

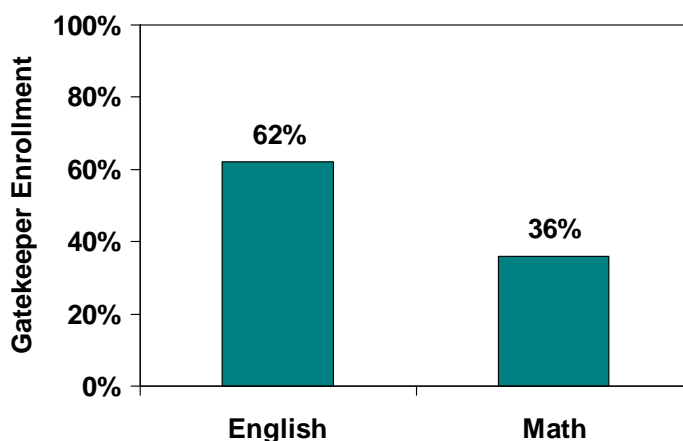


\*Note: Rates are for students in transfer programs only.

**Finding:** *Gatekeeper course enrollments (within 4 years) were low, especially in math. Gatekeeper course enrollments varied by the level of developmental course enrollment, but not by whether or not students complied with developmental recommendations.*

Among all students in the summer/fall 2004 entering cohort, less than two thirds (62 percent) enrolled in gatekeeper English, and little more than a third (36 percent) enrolled in gatekeeper math (see Figure 4). Whether students enrolled in gatekeeper courses depended on whether they took developmental courses, and the level of the course they took (see Figure 5, which shows the proportion of English gatekeeper enrollment by reading and writing recommendation, and the proportion of math gatekeeper enrollment by math recommendation). Among developmental students, those who started at lower levels of developmental coursework (“Dev – Lowest”) were much less likely to take gatekeeper courses than either those who started at the highest level of developmental coursework (“Dev – Highest”) or those who did not take any developmental courses in the subject (“No Dev”). The outcomes were particularly poor for students who started in the lowest level of developmental math (pre-algebra): only 19 percent of them eventually enrolled in gatekeeper math. Students who started at the highest level of developmental coursework in reading and writing had relatively similar rates of taking gatekeeper English as those who took no developmental courses, while students who started in the highest level of developmental math course had a *higher* rate of gatekeeper course enrollment than did students who took no developmental coursework. We investigated this issue further and learned that the pattern emerged because the “no developmental enrollment” category includes two distinct groups of students: those who were recommended to take a developmental math course but did not, and those who were not recommended to take developmental math. The first group had a relatively low rate of enrollment in gatekeeper math (35 percent) while the second had a much higher rate (75 percent). Since the first group is much larger, the overall percentage of participation in gatekeeper math is low.

**Figure 4: Enrollment in Gatekeeper Courses**



**Figure 5: Enrollment in Gatekeeper Courses**

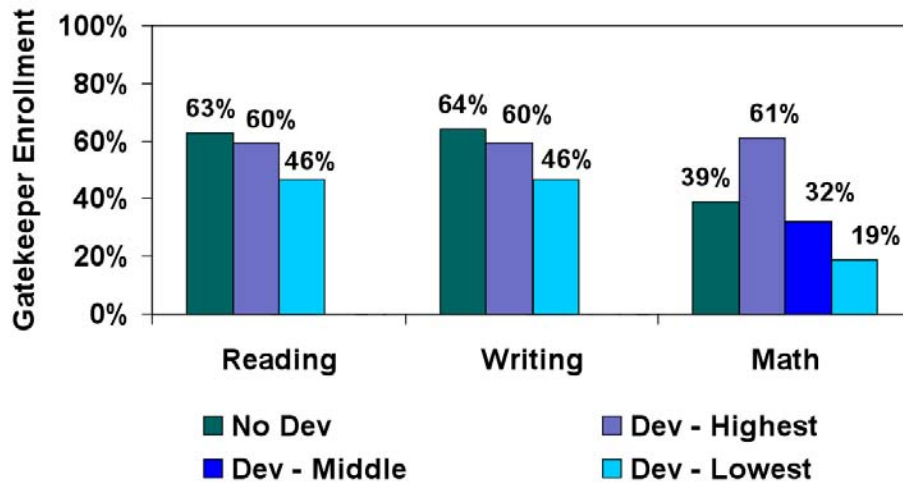
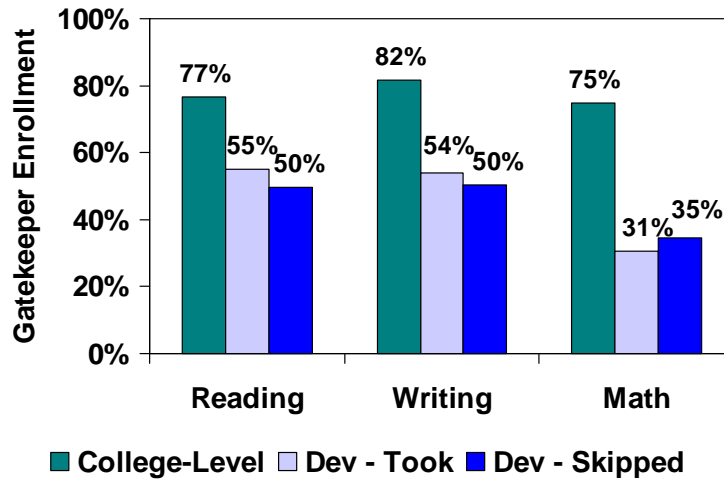


Figure 6 compares gatekeeper enrollment rates among students who were referred to college-level courses (“College-Level”), those recommended to developmental education who took at least one such course (“Dev – Took”), and those recommended to developmental education who skipped the developmental sequence (“Dev – Skipped”). Students who were not recommended to take a developmental course in a given subject were far more likely to enroll in a gatekeeper course for that subject. Yet among students who were recommended to take developmental instruction, the rate at which they enrolled in gatekeeper courses did not differ much depending on whether or not they complied with the placement recommendation. In fact, among students referred to developmental math, a somewhat higher percentage enrolled in gatekeeper math *without* taking the recommended developmental coursework than did those who followed the recommendation and took a developmental course (35 percent versus 31 percent).



**Figure 6: Enrollment in Gatekeeper Courses**



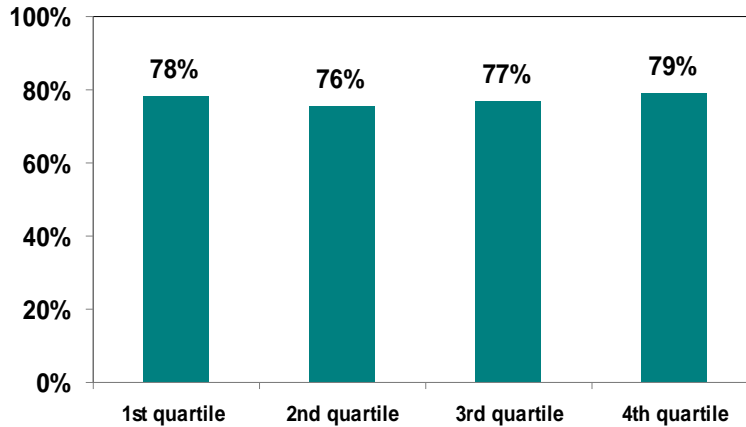
**Finding:** *A substantial proportion of students with high placement test scores did not take gatekeeper courses.*

Students with higher placement test scores were more likely to take gatekeeper courses than were students with lower test scores. However, a substantial number of students with high test scores did not take gatekeeper courses. For example, for students scoring in the top quartile of reading and writing, between 15 and 20 percent did not take gatekeeper English. Among students in the highest quartile of the pre-algebra test, only 31 percent took a gatekeeper math course, although higher percentages of students in the highest quartiles of algebra (65 percent) and college algebra (75 percent) took gatekeeper math. The same pattern holds for placement recommendations. Thus, even among students who were arguably well prepared for college-level work (based on their test scores and recommendations), many were not proceeding to gatekeeper courses. Understanding why students, particularly those with high test scores, are not proceeding to gatekeeper courses warrants further investigation.

**Finding:** *Placement test scores in reading and writing did not predict whether students passed gatekeeper English. Math test scores had a stronger association with passing gatekeeper math.*

Figure 7 shows the predicted probability of passing gatekeeper English by reading test score quartiles for students placed in transfer programs. We estimated these probabilities using regressions to control for individual student characteristics and institutions attended. The probabilities are virtually identical across test score quartiles, indicating that there is no relationship between reading test scores and whether students passed gatekeeper English. A similar pattern was found for writing. Math placement test scores seem to predict outcomes better than reading and writing scores. The predicted probability of passing gatekeeper math was 9 percentage points higher for students in the highest (4<sup>th</sup>) quartile of the pre-algebra test score distribution than for those in the lowest (1<sup>st</sup>) quartile. There is a similar gap (8 percentage points) between students in the highest and lowest algebra test score quartiles.

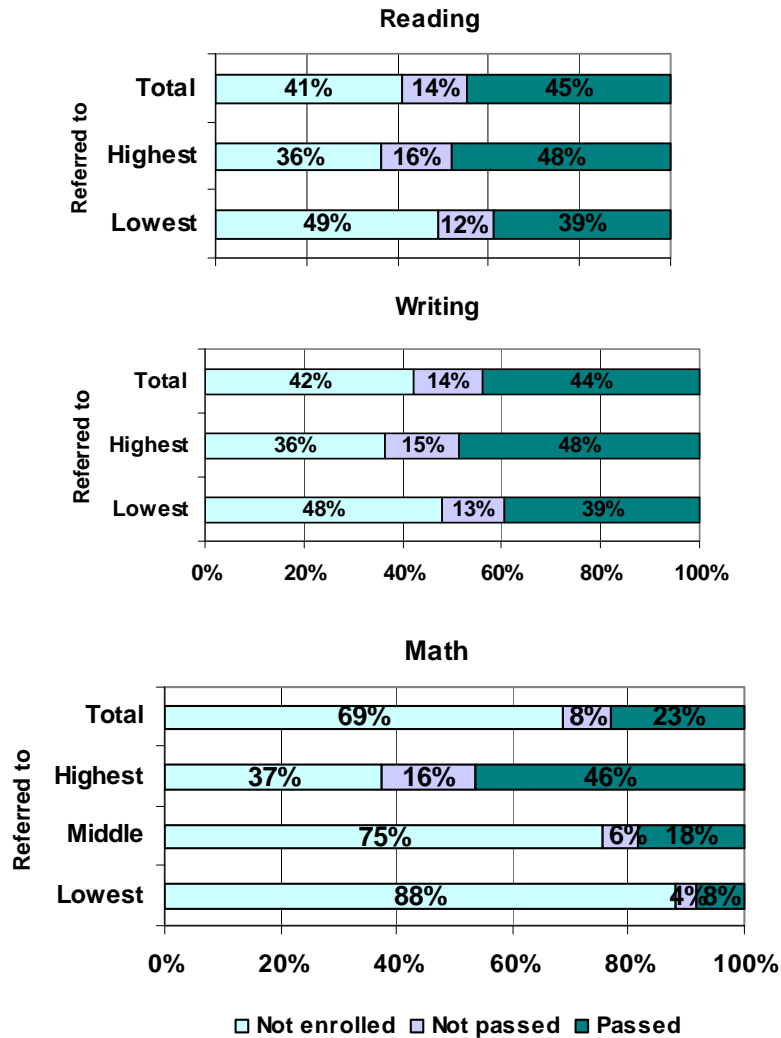
**Figure 7: Predicted Probability of Passing Gatekeeper English, by Reading Test Score Quartiles, for Students Placed in Transfer Programs**



**Finding:** *The proportion of students completing gatekeeper courses was low, especially for students referred to the lowest level of developmental education. However, the low overall completion rate emerged largely because students did not enroll in these courses. Among those who did enroll in gatekeeper courses, pass rates were fairly high.*

Only 47 percent of students in the summer/fall 2004 entering cohort completed gatekeeper English within four years, and a mere 26 percent completed gatekeeper math. Focusing on those students who enrolled in developmental education, Figure 8 shows the proportion of students in transfer programs who never enrolled in the corresponding gatekeeper course, who enrolled but did not pass, and who eventually passed the gatekeeper course (with a grade of C or better). Gatekeeper completion rates were especially low among transfer-placed students referred to the lowest level of developmental instruction. For example, only 8 percent of students referred to the lowest-level developmental math course completed gatekeeper math, compared with 46 percent of students in the highest level of developmental math.

**Figure 8: Gatekeeper Enrollment *and* Performance\***



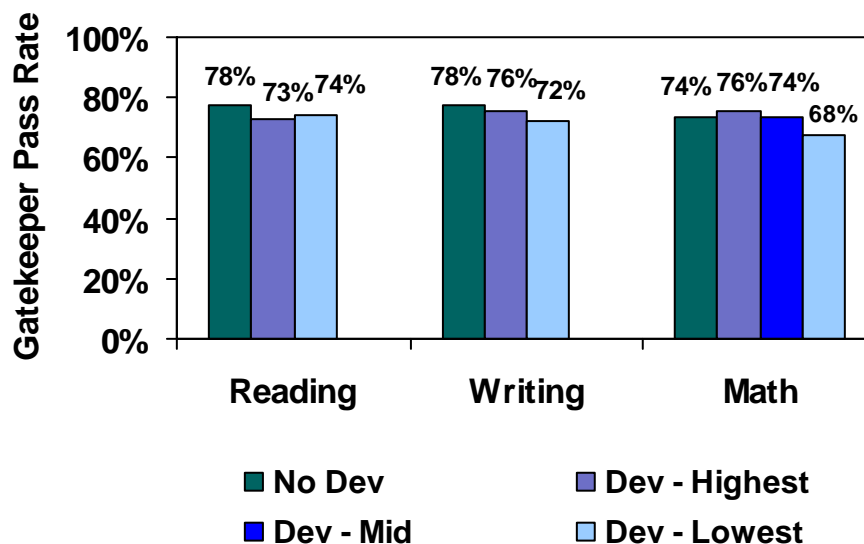
\*Note: Rates are for students in transfer programs only.

In general, low overall completion rates emerged largely because students did not enroll in gatekeeper courses. Over one third of students did not attempt to take gatekeeper English and two thirds did not enroll in gatekeeper math. Non-enrollment in gatekeeper courses was even more pronounced among students who were recommended to take developmental courses. Students who did enroll in gatekeeper courses had a reasonably high degree of success: 77 percent of students passed gatekeeper English with a grade of C or higher, and 73 percent passed gatekeeper math. Similar patterns held for students placed in transfer and career tech programs. This result is consistent with findings from research by CCRC on colleges involved with the Achieving the Dream initiative, a national community college reform effort (Bailey, Jeong, & Cho, 2009). Thus, for community colleges in Virginia and elsewhere, a key challenge is motivating students to enroll in gatekeeper courses in the first place.

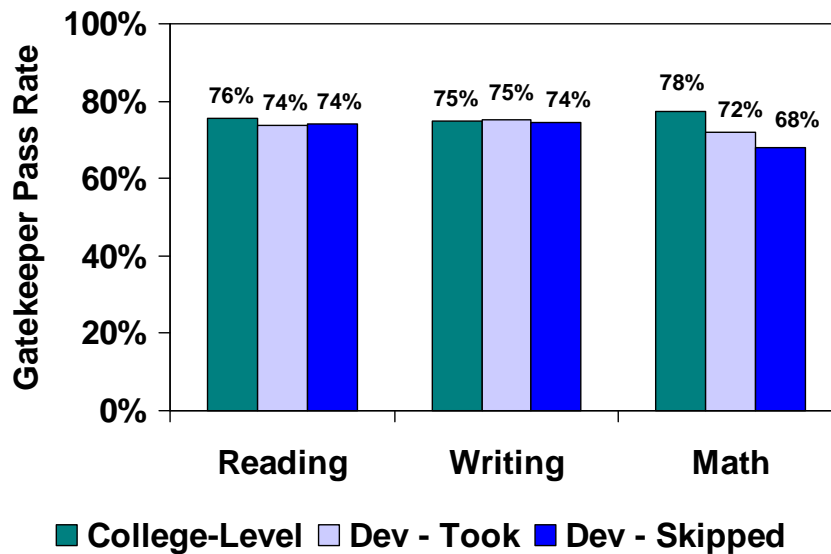
**Finding:** *Gatekeeper course pass rates were similar across students who enrolled in different levels of developmental education. Gatekeeper course pass rates also did not vary strongly by whether or not students complied with their developmental course recommendation.*

Among students who enrolled in a gatekeeper course, rates of passing (with a C or better) did not differ markedly between those who previously took developmental courses and those who did not (see Figure 9). About three quarters of students who took no developmental reading or writing but later enrolled in gatekeeper English were able to pass the course with a C or better. Similar percentages of students who enrolled in different levels of developmental coursework in reading or writing completed gatekeeper English. Even in math, where gaps in gatekeeper enrollment were more pronounced, differences in gatekeeper passing rates between students who did and did not take developmental math were relatively small. Moreover, gatekeeper passing rates did not differ by whether students followed their placement recommendation. Among students recommended to developmental education who later enrolled in gatekeeper courses, those who complied with developmental recommendations had similar rates of passing with a C or better compared to those who did not comply (Figure 10).

**Figure 9: Performance in Gatekeeper Courses**



**Figure 10: Performance in Gatekeeper Courses**



These findings seem to conflict with one other. The finding that students who took developmental courses did about as well in gatekeeper course as those who did not (Figure 9) might be interpreted to indicate that developmental education enables those who complete it to succeed in gatekeeper courses. Yet, the finding that students who were recommended to developmental education but skipped it did as well as those who took developmental courses (Figure 10) suggests that developmental instruction does not make a difference.

In fact, these findings cannot indicate whether or not developmental education is effective. CCRC was able to determine that there is a *correlation* between student behaviors (such as taking developmental courses or complying with a developmental recommendation) and success in gatekeeper courses; but this does not imply a *causal* relationship. It may be that students who are referred to developmental instruction but nevertheless skip it differ from students who enroll in developmental coursework in their level of motivation or other unobserved characteristics. Similarly, students who take and *complete* a developmental sequence may be especially motivated or otherwise different in ways that would explain the fact that they do as well in gatekeeper courses as students who do not participate in developmental instruction. The results do indicate that it would be useful to explore why some students decide to forego developmental instruction and are nevertheless successful in completing gatekeeper courses and other educational outcomes.

***Finding:*** *There was substantial variation among Virginia community colleges in the rates at which students enrolled in and passed developmental and gatekeeper courses.*

Among Virginia's community colleges, the proportion of entering students who enrolled in developmental reading ranged from 5 percent to 25 percent. Similar variation was evident for developmental writing and math. The proportion of students enrolling in gatekeeper English ranged from 50 percent to 71 percent; the range for gatekeeper math was even wider, from 17 percent to 50 percent.

Among students who enrolled in gatekeeper English, pass rates ranged from an average of 66 percent to 85 percent; average math pass rates ranged from 58 percent to 89 percent across institutions. The correlation between gatekeeper enrollment and pass rates at the institutional level was very weak, indicating that some institutions are more successful at getting students to take these courses, while others are more successful at getting them to pass the courses. Similarly, some institutions are better at helping students take and pass gatekeeper English while others are more effective at getting students to take and pass gatekeeper math. These differences indicate that every Virginia community college has something to offer as well as something to learn from the others in the system.

***Finding:*** *Similar patterns were observed with respect to other academic outcomes.*

The CCRC study examined an array of other academic outcomes, including attempting and accumulating college credits, earning certificates or associate degrees, and transferring to four-year institutions. Results for these academic outcomes followed similar patterns as those for gatekeeper success: students who enrolled in lower levels of developmental instruction did more poorly, and students who did not comply with developmental recommendations did just as well as those who complied. For example, only 18 percent of students starting in a pre-algebra course (the lowest level of developmental math) earned a certificate or associate degree or transferred to a four-year institution, compared with 39 percent of students who started math in Algebra II or higher. Similar differences in success rates, though perhaps not so stark as in math, were evident in reading and writing.

Taking and passing college-level English and math are only two of several milestones on the way to success in college. Still, they are important both because they are generally required for degree programs and because their attainment is associated with increased chances of earning a credential or transferring to four-year institutions. Given that similar patterns are observed in other key outcomes, it is important to better understand why some students take and pass gatekeeper courses while others do not, and to identify strategies colleges can use to increase students' success in these gatekeepers and beyond.

## Recommendations

Based on the findings from the study summarized here, CCRC made recommendations to the Virginia community colleges toward the goal of improving the success of academically unprepared students in gatekeeper courses. The recommendations presented here are those that may be applicable to colleges outside Virginia.

***Recommendation:*** *Colleges should investigate why students recommended to take developmental instruction do not take these courses.*

CCRC's analyses of developmental course-taking in Virginia's community colleges likely underestimate the extent of the need for remediation, as some schools were missing large amounts of placement recommendation data. Yet even the available data indicate that over one third of students recommended for a developmental course in reading, writing, or math did not take a single developmental course in that subject. Colleges with similar patterns of non-compliance should ask students (through focus groups and surveys) why they choose to circumvent these requirements.

***Recommendation:*** *Since students who did not follow their placement recommendations fared as well as students who were recommended for and took developmental courses, colleges should investigate this phenomenon further and learn from students about alternative strategies for success.*

Students who were recommended for but did not take developmental courses fared equally well (with respect to taking and passing gatekeeper courses and the other educational outcomes examined) as did students who were recommended for and enrolled in developmental courses. This finding suggests that failing to follow placement recommendations is not always detrimental to student success. It is important to note that the finding does not imply that developmental instruction is not effective or not needed. Students who skip developmental courses may differ from those who enroll in them with respect to a number of unobserved characteristics, which may account for their higher success rates. However, these results suggest that it would be useful to explore why some students forego developmental instruction and are nevertheless successful.

***Recommendation:*** *When considering the effectiveness of developmental instruction or developing policies and practices to facilitate student success, colleges should consider the level of developmental courses taken by students instead of grouping all students in need of remediation together.*

Not all Virginia community college students who required remediation fared the same. Analyses separating students by level show that students who started community colleges in the lowest level of developmental courses did less well with respect to all outcomes examined, including completing developmental courses, completing gatekeeper courses, accumulating credits, or earning credentials. These patterns persisted even after controlling

for individual characteristics, including test scores and institutions attended. Even when we controlled for student demographics and other factors that might bear on success (see the full report for details), the gaps between students starting in the lowest level of developmental courses and other students were notable, particularly for math.

***Recommendation:*** *Colleges might consider recommending alternative enrollment pathways for students in the lowest level of developmental courses.*

Given the low rates of success for students recommended to the lowest developmental courses on entry, colleges may want to consider alternative approaches to facilitating their educational success. For example, colleges may consider encouraging such students to enroll in occupational certificate programs that do not require college-level math and English as an intermediate step toward eventually earning a degree. Community colleges in Washington State have seen promising results from programs that enable adult basic skills students (many of whom are at a level of readiness similar to that of the lowest level developmental students) to enter and succeed in occupational certificate programs. In the approach developed by the Washington colleges, known as I-BEST, adult basic skills students enroll in college-level career technical programs that are jointly taught by basic skills and career-technical instructors (Jenkins, Zeidenberg, & Kienzl, 2009).

***Recommendation:*** *Colleges should consider surveying students to learn why so many are not enrolling in gatekeeper courses and develop policies to motivate gatekeeper enrollment.*

Many students examined in this study did not complete gatekeeper courses, not because they did not pass these courses, but because they never enrolled in them. Approximately one third of students never enrolled in gatekeeper English and two thirds never attempted gatekeeper math. Low gatekeeper enrollments were apparent for all groups of students — those with different test scores, those in academic transfer and career-technical programs, and those taking different levels of developmental courses — but rates were particularly low among students starting in the lowest level of developmental courses. Students who did enroll in gatekeeper courses had a relatively high degree of success: 77 percent passed gatekeeper English and 73 percent passed gatekeeper math. Moreover, developmental students who enrolled in gatekeeper courses were approximately equally likely to succeed regardless of their starting point.

It is not clear whether students' lack of enrollment in gatekeeper courses was due to limited capacity to enroll students who needed such courses, problems with scheduling, lack of counseling and/or of students' understanding of the courses they needed to take, or other reasons. Surveying students to understand why they are not enrolling in these courses would help to illuminate factors deterring students from gatekeeper courses and inform the development of policies to motivate and facilitate enrollment in gatekeeper courses.



**Recommendation:** *Colleges should explore strategies for increasing enrollment in gatekeeper math, given the low rate of participation in such courses.*

While not taking gatekeeper math courses was an issue for many students, it was particularly pronounced among students in need of remediation (whether that is defined by test scores, placement recommendations, or actual enrollment in developmental courses). Given low gatekeeper math enrollment rates, colleges should explore strategies for increasing enrollment in math, which may entail working with high schools to improve math preparation, providing summer bridge programs, altering the structure of developmental instruction in math, or providing alternatives to College Algebra that teach students mathematics relevant to the degree programs and career fields they are seeking to enter.

**Recommendation:** *Colleges might investigate whether “mainstreaming” some students, particularly those referred to the highest level of developmental coursework in a given subject area, directly into college-level courses, while providing additional supports as needed, is an effective strategy for facilitating their educational attainment.*

Some students referred to developmental education chose to circumvent those recommendations, and yet they were able to succeed at a rate similar to those that complied with placement recommendations. Placement tests do not purport to capture the complete range of factors that allow students to succeed (for example, personal motivation and interpersonal supports). Accordingly, it may be appropriate to allow some students who score below the college-ready threshold to attempt college-level classes, particularly if such students are supplied with systematic academic and non-academic supports. Programs that attempt to accelerate the progress of remedial students into college-level courses by offering developmental instruction concurrently with related college-level courses or by integrating academic support into college courses have shown some promise (see, e.g., Bragg & Barnett, 2009; Scott, 2003; Wlodkowski 2003; Wlodkowski & Kasworm, 2003), although these approaches have not yet been rigorously evaluated (Bailey, 2009).

**Recommendation:** *Colleges should review policies and practices aimed at increasing gatekeeper course completion among college-ready students, and look for promising practices both within and outside the system.*

Even among students who were reasonably well prepared academically, many did not make good progress toward a degree. Over 15 percent of students in the top quartiles of the reading and writing tests did not enroll in gatekeeper English, and 25 percent of students in the top quartile of the college algebra test did not enroll in gatekeeper math. This finding indicates that academic preparation (or lack thereof) is not the only factor that needs to be addressed to improve gatekeeper enrollment rates. Understanding why even students who are considered prepared for college-level work are not achieving key milestones is an important step in enhancing overall success rates. It is likely that policies designed to assist academically

prepared students to complete gatekeeper courses will also be beneficial for students in need of remediation.

***Recommendation:*** *Colleges should examine the practices of their peers that are more effective in enabling student success and should share promising practices. State systems should facilitate this exploration and sharing.*

There was much variation across the Virginia community colleges in the rates at which students enrolled and passed gatekeeper courses. For example, the average proportion of the cohort who enrolled in gatekeeper math in the four-year study period ranged from 17 percent in one school to 50 percent in another. In addition, some institutions are more successful at getting students to enroll in gatekeeper courses, while others are more successful at getting enrolled students to pass them. Similarly, some institutions are better at helping students progress through gatekeeper English, while others are more effective in terms of gatekeeper math. Thus all institutions have something to offer as well as something to learn from the others.

To provide research-based guidance on this issue, CCRC is partnering with VCCS on a study, funded by the Bill and Melinda Gates Foundation, of colleges identified through quantitative analysis as comparatively effective (controlling for student characteristics and other factors) in enabling students to take and pass gatekeeper English and math. VCCS has also received funding from the Gates and Lumina foundations through the Achieving the Dream initiative to organize discussion of college-level data on student attainment of key milestones and sharing of promising practices for improving student success among colleges. Five other states (Connecticut, Florida, North Carolina, Ohio, and Texas) are involved in the initiative and are engaged in similar activities. The approach these states are following has the potential to promote systemic changes that benefit large numbers of students and to inform changes in state policy that provide colleges with resources and incentives to continue to innovate over time. For this reason, other states should consider following their lead.

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