Student Supports: Developmental Education and Other Academic Programs

Eric P. Bettinger, Angela Boatman, and Bridget Terry Long

Summary

Low rates of college completion are a major problem in the United States. Less than 60 percent of students at four-year colleges graduate within six years, and at some colleges, the graduation rate is less than 10 percent. Additionally, many students enter higher education ill-prepared to comprehend college-level course material. Some estimates suggest that only one-third of high school graduates finish ready for college work; the proportion is even lower among older students. Colleges have responded to the poor preparation of incoming students by placing approximately 35 to 40 percent of entering freshmen into remedial or developmental courses, along with providing academic supports such as summer bridge programs, learning communities, academic counseling, and tutoring, as well as student supports such as financial aid and child care. Eric Bettinger, Angela Boatman, and Bridget Terry Long describe the role, costs, and impact of these college remediation and academic support programs.

According to a growing body of research, the effects of remedial courses are considerably nuanced. The courses appear to help or hinder students differently by state, institution, background, and academic preparedness. The mixed findings from earlier research have raised questions ranging from whether remedial programs, on average, improve student academic outcomes to which types of programs are most effective. Administrators, practitioners, and policy makers are responding by redesigning developmental courses and searching for ways to implement effective remediation programs more broadly. In addition, recent research suggests that colleges may be placing too many students into remedial courses unnecessarily, suggesting the need for further examining the placement processes used to assign students to remedial courses.

The authors expand the scope of remediation research by discussing other promising areas of academic support commonly offered by colleges, including advising, tutoring, and mentoring programs, as well as supports that target the competing responsibilities of students, namely caring for dependents and balancing employment with schoolwork. They conclude that the limited resources of institutions and equally limited funds of students make it imperative for postsecondary institutions to improve student academic supports and other services.

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Students often arrive at college facing multiple challenges, including inadequate academic preparation, competing obligations to work and family, and limited experience navigating the complexities of collegiate systems and requirements. Although all these challenges pose problems for college completion, the primary obstacle is poor preparation for college-level coursework. Data from the National Center for Education Statistics indicate that in 2004 only 26.8 percent of high school seniors had completed "high-level" academic coursework, defined as four years of English, three years of mathematics (including at least one year of a course higher than algebra II), three years of science, three years of social studies, and two years of a single non-English language.[1] A separate study found that only 32 percent of students leave high school at least minimally prepared for college academically.[2] A lack of alignment between the K–12 and postsecondary education systems compounds the problem, frequently resulting in confusing messages to students and their parents about what students should do to enter and succeed in college.[3]

Although all students face challenges in higher education, underprepared students confront more urgent problems, both academically and more broadly. While adjusting to a new environment, they must simultaneously acquire college-level academic skills. Difficulties in the classroom can be discouraging and can complicate the academic, social, and financial adjustments to college.[4] Ultimately, academic struggles may lead to lower self-esteem, greater frustration, and higher drop-out rates.[5] Asked to make complex choices about their field of study and future plans, students may find it increasingly difficult to respond to the demands of college. To help them succeed, many postsecondary institutions offer a range of academic and cocurricular supports.

Remedial courses, which fall under the broad term of remediation, are the support most widely used by colleges to address the academic needs of underprepared students.[6] These courses (commonly referred to as developmental courses by practitioners) target underprepared students with the purpose of improving their abilities to handle college-level material and succeed in college. Research suggests that more than one-third of all first-year students in college today are taking some form of remedial coursework in either English or mathematics; the share can climb to six out of ten students at some postsecondary institutions.[7] The bulk of remediation is provided by nonselective public institutions, the point of entry for 80 percent of four-year students and virtually all two-year students.[8]

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To better meet the needs of underprepared students, some colleges have implemented interventions such as summer bridge programs, learning communities, academic counseling, and tutoring. Others have tried to

address nonacademic student needs that may affect academic performance, such as developing programs to help older, nontraditional students with nonacademic barriers such as child care and transportation.

In this article we examine remedial education and other kinds of student supports. We first consider remediation, including the students who need it, how it is organized, how much it costs, and what researchers have learned about its effects on student outcomes. We then discuss additional academic supports, including advising, tutoring, and mentoring programs. Next, we focus on supports that target the competing responsibilities of students, namely caring for dependents and balancing employment with academic obligations. Overall, we consider whether and how these supports help students to be successful and how colleges and universities might improve their efforts to support students.

Helping the Underprepared Student: College Remediation

Most students in remediation are recent high school graduates who have exited secondary school without grade-level competency or the proper preparation for college-level material, but more than 25 percent are over the age of thirty.[9] Recent structural shifts in the labor market have displaced many adult workers, who subsequently enroll in college to acquire the skills necessary for re-employment; many need to refresh their math, reading, and writing skills. Another group of students in remediation includes those who were not born in the United States or who grew up speaking languages other than English, or both. Of the 2.6 million students attending community colleges in California, for example, an estimated 25 percent speak English as a second language.[10] Nonnative English speakers in need of remediation most commonly enroll in developmental English or English as a Second Language (ESL) courses.[11] Remedial and developmental courses allow colleges to offer access to students whose life circumstances or earlier academic experiences might otherwise have been a barrier to college entry.

Students in remediation may have earned a high school diploma, but may still not be academically prepared for success in college. The need for remediation in college is closely tied to a student's high school curriculum.[12] A 2002 study by the Ohio Board of Regents found that students who had completed an academic core curriculum in high school were half as likely to need remediation in college as students who had not.[13] Completing a high school core curriculum, however, does not necessarily ensure that a student will avoid remediation in college. Many students who complete upper-level math courses in high school still require math remediation courses or need to repeat subjects in college.[14] That students who are "academically prepared" still need to be in remediation suggests that the problem is larger than just poor high school course selection or the lack of a college-preparatory curriculum at some schools.[15]

The Organization and Delivery of Remedial Education

Postsecondary institutions across the nation offer remedial courses structured in a variety of ways. Traditional remedial courses generally take a fifteen-week, semester-long format. Courses are typically, but not universally, offered for credit and count toward a student's overall grade point average but not toward graduation requirements. The vast majority of colleges offer multiple levels of remedial and developmental courses within

a subject area (for example, English language arts or mathematics) to meet the needs of students from a wide range of academic backgrounds. For example, many institutions offer up to three developmental mathematics courses below college-level mathematics: *Developmental Algebra II* for students just below college-level mathematics and in need of algebraic computational skills, *Developmental Algebra I* for those needing to learn functions, quadratic equations, and inequalities, and *Remedial Arithmetic* for those in need of computational arithmetic skills.[16] The course sequence in remedial English courses is generally similar.

Because students most commonly have to succeed in their assigned developmental course before moving on to the next course in the sequence, remedial courses are often the gateway to college-level courses. More than four-fifths of campuses nationally restrict enrollment in some college-level classes until remediation is complete, and most require students placed into remediation to enroll in the course recommended by the institution.[17] Students in need of multiple remedial courses in the same subject could thus take courses for more than a year before fulfilling their remedial requirements. Not surprisingly, students assigned first to the higher developmental mathematics courses complete their developmental course sequence and move on to a college-level mathematics course at higher rates (45 percent) than those assigned to the lowest-level courses (17 percent). Rates are even lower for men, older students, African American students, part-time students, and students in vocational programs.[18] Because remedial courses rarely count toward a student's graduation requirements, remediation may decrease rates of degree completion. As shown in a 2012 study by Davis Jenkins and Sung-Woo Cho, factors that extend the time it takes students to complete degrees are also associated with a lower probability of degree completion.[19]

Students are usually assigned to remedial courses based on an exam or assessment taken when they arrive on campus. About 92 percent of institutions use some kind of standardized placement exam to assign students to remedial or developmental courses.[20] The most widely used placement exams are the Computerized Adaptive Placement Assessment and Support Systems (COMPASS) and the Assessment of Skills for Successful Entry and Transfer (ASSET), each published by ACT, Inc., as well as the ACCUPLACER published by the College Board. Some schools also use state standardized test scores and high school transcripts to help make assignments. Typically, administrators base course assignments on "hard" cutoffs—students scoring below a single given threshold are assigned to a remedial course. Students are placed into mathematics remediation more often than into English language arts (that is, reading or writing or both) remediation,[21] but English remediation may be even more critical to a student's academic success because reading and writing skills are fundamental to most other subjects.

The Costs of Remediation

A study by the Alliance for Excellent Education concluded that the total cost of delivering remediation nationwide during the 2007–08 school year was $3.6 billion in the form of direct costs both to students (for example, tuition) and to institutions (for example, instructional costs). The study also estimated additional costs beyond these direct costs in the form of lost earning potential for those remedial students who may be

more likely to drop out of college without completing a degree.[22] In 2008, a report by the Strong American Schools project used higher education expenditure data collected by the U.S. Department of Education to estimate that the total taxpayer cost of remediation per student ranged from $1,607 to $2,008 in two-year colleges and between $2,020 and $2,531 in four-year colleges.[23]

Although remedial and developmental courses often do not count toward graduation requirements, students must nevertheless pay tuition for these courses and bear the opportunity cost of forgone earnings. In 2003–04, Florida community college students who required remediation took an average of nine credit hours of remedial coursework and paid an additional $504 for college prep coursework during their first year of college.[24] Given that many remedial students also receive federal financial aid, taxpayers shoulder a portion of the cost of remediation as well.

Although remediation is expensive for colleges to provide, it may be less costly than other college courses, as remedial courses often have comparatively larger class sizes and a higher prevalence of lower-paid adjunct instructors.[25] The Ohio Board of Regents found that although 38 percent of students in the state's public two-year colleges were enrolled in developmental courses, such courses accounted for only 3.6 percent of the total budget for instructional spending.[26] Because institutions are able to lower the cost of offering remedial courses through a variety of administrative and instructional decisions, while students are unable to lower the amount they pay in tuition, the cost of remediation can be unevenly distributed. In cases like this, remedial and developmental courses have the ability to generate revenue, which gives perverse incentives to schools to reduce instructional spending on the students most in need of high-quality instruction.[27] Although the costs of remediation are generally high, the social costs of not offering remediation may be higher still. Unskilled individuals are more likely not only to collect unemployment and welfare benefits but also to commit crime and be incarcerated. Moreover, the changing demands of the twenty-first-century economy require efficient retraining. A 2005 study conducted for the Texas Public Policy Foundation estimated that when students leave high school without acquiring basic reading, writing, and math skills, the state loses more than $13.6 billion annually in terms of lower earnings potential, poor worker productivity, and increased spending on social programs.[28] Proponents argue that remediation programs help postsecondary institutions fulfill their obligation to assist students who may have attended poor-quality K-12 schools. Remediation efforts can provide such students a second chance to learn the basic skills necessary for future labor market success.

The Effects of Remediation on Student Outcomes

A growing body of research is emerging on both the scope and effectiveness of college remediation. Many earlier descriptive studies merely compare samples of remedial students to their peers, without noting that students in need of remediation may differ from their more academically prepared peers in both their observed and unobserved background characteristics. Comparing the outcomes of these two very different types of students without taking into account these unobserved differences, such as student ability and motivation, can lead to biased estimates of the impact of remediation on subsequent academic outcomes.[29] Short of randomly assigning students on the margins of needing

remediation to either remedial or college-level courses, it can be difficult to ascertain whether differences in student outcomes are *caused* by students' enrollment in remedial classes, or are instead explained by their lower levels of academic preparation—the very thing that required them to be remediated in the first place.

Given the importance of remediation and the limitations posed by bias in past research, several recent studies have tried to establish the causal effects of remediation using quasi-experimental research designs. Much of the existing research, however, focuses on students at the margin of passing out of remediation and compares students who score just above and below the cutoff on the remediation placement exam.[30] Remediation was found to increase the probability of college persistence at a large state university in the Northeast and in four-year colleges in Ohio.[31] In a study of more than 100,000 community college students in Florida, Juan Carlos Calcagno and Bridget Terry Long found that assignment to developmental courses increased both persistence to the second year and the total number of credits completed, although not degree completion.[32] A study of Texas students concluded that placement into remedial courses had little effect on the number of credits attempted, receipt of a college degree, or future labor-market earnings among students scoring around the test-score cutoff.[33] Using data from the National Education Longitudinal Study of 1988, Paul Attewell and colleagues used a propensity score matching technique to create observationally similar groups of students, half of whom had taken remedial courses and half of whom had not, and concluded it was less probable that students in remedial courses would receive a bachelor's degree but no less probable that they would receive an associate's degree or certificate.[34] The mixed results from these studies suggest that the causal effect of remedial courses on student outcomes for students at the margin of passing out of remediation is not yet fully understood. Because many educational interventions have had varying effects on students of different genders, races, and other demographic characteristics, however, it is plausible that remedial courses may also have varying effects on different types of students.

Do the Effects of Remediation Differ by Student Characteristics and Ability?

Additional work by Long and Calcagno focusing on Florida found that the effects of remediation differed by student background and demographics.[35] Women, for example, experienced more positive effects from placement into remediation than did men. This finding could relate to other differences documented by gender—such as learning styles, levels of engagement, or amount of study time—and may give clues about why remediation works for some students but not others.

Older students placed into remediation also had more positive outcomes than did younger peers. One explanation could be that older students are more focused or ready to take advantage of "refresher" courses or the opportunity to "catch up." It could also be that older students have a greater need for developmental courses because they have been out of high school longer. If so, then older students who score just high enough not to be placed in remediation might benefit from taking the courses regardless of placement status.

Remediation's effectiveness also appears to vary by income. Low-income students (that is, students receiving Pell Grants) had more

negative outcomes in remediation than higher-income peers in terms of persistence, associate's degree completion, transfer rates, and credits earned. Because income is often highly correlated with high school quality and the availability of "high-level" academic coursework,[36] the underlying cause of these differences may be academic preparation. Because Pell Grants do not usually cover the full costs of education, it may also be that affordability interacts with performance in remediation and afterwards. Further investigation of the interaction of financial need and remedial experiences may clarify these relationships.

More recently, research has explored whether the mixed results of earlier studies may be explained by differences in students' academic preparation. Using data from the public colleges in Tennessee, Angela Boatman and Bridget Terry Long examined how remedial and developmental courses affect the academic outcomes of students with varying levels of academic preparation.[37] The state's system of assigning students to one of four levels of math and one of three levels of reading or writing enabled them to explore the effects of more and less remediation, from students who need only one developmental course to those who need multiple courses. The study found that the effects of the courses differ by the level of student preparation, with students on the margin of needing remediation having large negative effects and students most needing remediation having smaller negative effects and sometimes even positive effects. Students in the lowest levels of remedial writing, for example, persisted through college and completed degrees at higher rates than their peers in the next level up, thus indicating that remediation could be beneficial for students with weaker preparation. Similar research conducted by Mina Dadger on students in Virginia's twenty-three community colleges, however, found that being assigned to three rather than two levels of remediation reduced the likelihood of earning a community college credential by 9 to 15 percentage points.[38] Dadger concluded that students assigned to the lowest level of remedial math would have benefited if they had been able to skip that remedial course. Recent research from Judith Scott-Clayton found that remedial assignment may be a significant discouragement to students whose test scores underrepresent their ability.[39]

The effects of remediation, then, are considerably nuanced: remedial courses appear to help or hinder students differently by state, institution, background, and academic preparedness. The mixed findings in earlier research present an interesting puzzle about why remedial and developmental courses have such different effects. Only by first identifying the subgroups of students whom remedial programs appear to be helping or hindering and the delivery methods associated with the largest effects can administrators, practitioners, and policy makers design and implement effective remediation programs more broadly. Further experimentation with different types of instructional models would be useful in helping to identify best practices. Randomly assigning students to the same remedial courses taught in different ways could help to identify more specifically those practices most effective in improving student outcomes.

Reforming the Delivery of Remediation

The mixed results of research have illuminated critical questions regarding not only whether remedial programs, on average, improve student academic outcomes, but also which types of programs are most effective.[40]

Educators are beginning to address those questions as institutions start to experiment with redesigning their developmental courses. In their work describing recent innovations in developmental education, Elizabeth Zachry and Emily Schneider distill the multitude of these redesign efforts into four broad types: reforms that shorten the time students spend in remedial courses, programs that combine basic skill attainment with college-level coursework, supplemental programs such as tutoring or advising, and interventions targeted to students before they enter college.[41]

Research findings on such redesigned courses are enlightening. A recent quasi-experimental study of an accelerated developmental English course at Chabot College found that students whose developmental English course was combined with their college-level English courses into one singular course were significantly more likely than students who took a developmental course alone to transfer to a four-year college, earn more college-level credits, and earn a certificate or degree, although these findings were mixed for ESL students.[42] Similarly, a descriptive study of the FastStart program at the Community College of Denver, which combined four developmental math courses into two, found that the program helped students to successfully complete their developmental sequence at higher rates.[43] In Washington state, the Integrated Basic Education Skills Training (I-Best) program combines instruction in basic skills with college-level material. Results from a multivariate analysis of this alternative model suggest higher rates of credit accumulation for participants over time, as well as persistence to the second year, with the largest gains found for adult basic education students and English language learners.[44] Remediation redesign efforts are also using technological strategies such as self-directed learning labs, online-learning models, and high-tech classrooms.[45] The aim is to shorten the time students spend in developmental courses, enabling them to move more quickly into their college-level courses, while also ideally creating efficiencies in the delivery of developmental education. Although few researchers have rigorously evaluated the effectiveness of technology in remedial education, the article by Bradford Bell and Jessica Federman in this issue provides a review of the research to date.[46]

Both individual institutions and state systems have shown increasing interest in redesigning their developmental education curriculum to address student needs. In the fall of 2007, the Tennessee Board of Regents received a three-year grant through the U.S. Department of Education to implement the Developmental Studies Redesign Project.[47] The goals were to enable postsecondary institutions to improve the effectiveness of their remedial math, reading, and writing courses and to serve more students better and at less cost.[48] Six colleges were selected to receive funding, but only four were able to fully implement changes in the first semester of the project. Although the separate course-redesign efforts differed in details, all involved a shift to using learning technology, both in and out of the classroom, to enable students to focus on the specific skills in which they were deficient.[49] For example, one of the three institutions that reformed their developmental math curriculum, Austin Peay State University, eliminated its developmental math courses and created enhanced sections of the two core college-level courses, Fundamentals of Mathematics and Elements of Statistics, for students whose ACT exam scores placed them in developmental math. The college-level courses were linked to Structured Learning Assistance workshops, which

provided students additional tutoring and assistance for any course material with which they were struggling.

Future research on the effects of these redesigned courses will show the extent to which the particular instruction and delivery methods of remedial courses affect subsequent student academic outcomes, thus informing administrators and policy makers how best to help underprepared students.

In her evaluation, Boatman used a regression discontinuity research design to conclude that students taking redesigned courses at the three institutions that redesigned their remedial math courses had more positive outcomes than similar students both from institutions that did not participate in the redesign and from previous cohorts at the same institutions.[50] Austin Peay saw the largest positive effects on persistence, suggesting that the cutoff used to assign students to developmental math may be too high and that some students who are now placed into developmental math courses would have better outcomes if they were placed directly into college-level math courses that offer additional support.

The Accelerated Learning Program (ALP) at the Community College of Baltimore County (CCBC) also "mainstreams" students placed into upper-level developmental writing courses directly into college-level English courses and offers a companion ALP course taught by the same instructor. A recent quasi-experimental study of the four-year effects of the program concluded that ALP students were 29 percentage points more likely to complete college-level English within one year, and 6 percentage points more likely to persist to the next year, than students who enrolled in traditional developmental English.[51] The study design, however, cannot rule out the possibility of self-selection bias—that is, that students who would elect to take the ALP companion course may, for example, be more motivated than those who did not and would therefore skew the findings. But the large positive effects at CCBC—together with the findings from Austin Peay—suggest that mainstreaming approaches merit further investigation.

Other states are also experimenting with course redesign. Since the spring of 2012, Virginia community colleges have taught developmental math as a series of nine one-credit modules, with students taking only the modules that are required for their field of study and in which the diagnostic placement test indicates a need for improvement.[52] The goal is to reduce the time required to complete remediation. Future research on the effects of these redesigned courses will show the extent to which the particular instruction and delivery methods of remedial courses affect subsequent student academic outcomes, thus informing administrators and policy makers how best to help underprepared students.

Accelerating Remediation with Summer Bridge Programs

One broad aim of several of the large-scale redesign efforts is to move students through

their remedial courses more quickly. Summer bridge programs offer students a similar opportunity by enabling them to take summer courses at their college for several weeks before they begin their freshman year. The bridge programs are generally voluntary and differ by type and length. Most, however, share a common target population: first-generation, low-income, and minority students in need of remedial coursework. The goal is to help students make the academic and social transition to college.[53]

To date, research on summer bridge programs is limited, as few studies have adequate control groups for comparison purposes. Descriptive studies examining persistence and grade point average indicate that students in summer support programs tend to perform better in their courses than students who do not receive such support.[54] In 2009, researchers at the National Center for Postsecondary Research reported results from a randomized experiment focusing on summer bridge programs in eight institutions in Texas. They found that the program did not affect students' persistence from the first to the second semester, but also found some evidence that summer bridge students were more likely to pass college-level courses in math and writing in their first semester.[55] This initial modest boost in achievement, however, did not last. After two years, the treatment group students and the control group showed no statistically significant difference in the number of semesters in which they had enrolled.[56]

Remediation in the Context of Learning Communities

Learning communities offer another model for helping students through their remedial courses. Learning communities organize students into cohorts that take paired remedial and college-level courses—a remedial writing course, for example, linked with an entry-level psychology course. In 2002, the National Survey of First-Year Academic Practices found that 62 percent of responding colleges used the learning community model, although at most only a small portion of the student body participated in those communities.[57] Although a recent report suggests that the learning community model is difficult to scale up,[58] it is nevertheless a popular approach to remediation.

Proponents of the learning communities model offer several reasons why it may be more effective than traditional models for teaching students with low basic skills. Linking a course like remedial English with a course of special interest to a student may make the material more engaging and motivate the student to work harder. Learning communities also offer students the opportunity to form deeper ties with their peers and with faculty, thereby strengthening their support networks and institutional attachment.[59]

Recently, as part of its Opening Doors Demonstration, the social policy research organization MDRC conducted a random-assignment evaluation of a learning communities program at Kingsborough Community College in Brooklyn. Analysts found that students in the learning community moved more quickly through their developmental English requirements, enrolled in and passed more courses, and earned more credits in their first semester overall than their peers who were not selected to participate in a learning community. The researchers also saw a positive effect of participating in a learning community on graduation after six years. It is worth noting that the Opening Doors program at Kingsborough also served students who did not need developmental

education (about 20 percent of the sample); this group largely drove the effect on graduation rates.[60] As part of the National Center for Postsecondary Research, MDRC conducted random-assignment evaluations of learning communities that targeted students in developmental English or math courses at five community colleges across the country in addition to Kingsborough. The evaluations showed that the learning communities did help students complete their developmental education courses, but that over a two-year period they had no effect on persistence in college and little effect on credit accumulation, leading to mixed conclusions about their effectiveness overall.[61]

Additional Academic Supports

Although remedial and developmental education is the most prominent support that postsecondary institutions offer students lacking basic academic skills, a related support involves services such as mentoring and advising in a wide variety of forms.

Past Evidence on Student Services

Student support services have long been part of the higher educational landscape, in accord with theories of student integration and engagement that posit that students who feel academically capable and connected to their institution are more likely to stay enrolled.[62] Such services include peer mentoring, memory and concentration skill building, early academic progress and warning monitoring, faculty mentoring, freshman seminar courses, group learning, proactive advising, time management workshops, and tutoring. The research corporation Westat conducted a series of evaluations of these services using longitudinal data for forty-seven postsecondary institutions that had received Department of Education funding for services during the 1990s.[63] Most of the studies used research methods that matched students receiving support services with similar students not receiving services to determine the effects of these programs on student outcomes. Generally the results were positive. The key methodological problem in these studies is self-selection bias—the likelihood that unobservable characteristics such as the desire to learn could lead certain types of students to choose to take advantage of these support services and therefore bias the results. A second complication is the timing of student services. Although most students use these services upon entry into college, many participate in later years. Evidence suggests that some of the positive effect comes from participating in services after the first year.[64] But the large attrition in students from one year to the next makes it unclear how earlier experiences in student services affects later participation. And even if a researcher can identify the specific service elements in which students participate, it is hard to identify which have been most effective because students generally receive multiple services simultaneously.

Recent Evidence on Student Services

Perhaps the most straightforward approach to addressing the complexity of the community college experience and the many needs of underprepared students is simply to enhance student advising. College advisers can support students in multiple ways: prepare them for their courses, counsel them on how to improve study skills, or provide advice on how they can identify additional academic resources at their own colleges.[65] Such support may be increasingly necessary, because traditional college counseling programs may be overextended in their efforts to support all students. According to the 2011 National

Survey of Academic Advising, the median caseload of a full-time academic adviser is 441 advisees at community colleges and 260 advisees at public four-year colleges.[66] A separate study found that at 55 percent of community colleges, the ratio of counselor to advisees is 1 to 1,500.[67]

The most prominent recent research on advising comes from a series of interventions that was part of the MDRC Opening Doors Demonstration. Beginning in 2003, Lorain County Community College and Owens Community College participated in enhanced academic advising projects as part of the intervention.[68] The advising project gave students financial incentives to meet with academic counselors (each counselor had 160 advisees) at least twice a semester for one year. Students randomly chosen to participate in the program were slightly more likely than peers who were not in the project to stay in school into the second semester and more likely to register again for school once the program had ended. But the effects of the intervention dissipated after the intensive college advising ended.[69]

Several advising programs have focused specifically on students in need of remediation. The Beacon Mentoring program at South Texas College, for example, randomly assigned students in mathematics classes to receive a mentor who encouraged them to use tutoring and other campus services and to reach out for help if needed. An MDRC evaluation found that the program increased students' use of the campus tutoring center and reduced the likelihood that they would withdraw from the course. The evaluation found several notable subgroup differences. Mentored classes helped part-time students pass their math classes at higher rates and helped students in developmental classes achieve higher scores on a final exam.[70] Similarly, a 2008 study by Peter Bahr concluded that enhanced advising had significantly greater effects on course success and transfer rates for students at the lowest levels of remediation.[71]

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A recent study in Canada randomized students into three treatment groups—one offering a range of support services including access to mentoring by older students and additional academic support, a second offering a financial fellowship, and a third offering a combination of services and financial incentives—and a control group.[72] According to the study, students who received the combination of financial incentives and support services earned more credits, had higher GPAs, and had lower levels of academic probation over the course of the year. The study, however, found significant effects only on female students; male students showed no increases in retention or academic success.

Yet another recent intervention focused on advising in a series of four-year colleges.[73] The advising, called "coaching," was offered by InsideTrack, a company that offers intensive, proactive advising. Rather than students going to an adviser, an

InsideTrack coach calls students and aggressively maintains contact. Like the advisers in other studies, InsideTrack coaches focus on information, study skills, motivation, and time management. Seventeen randomized experiments evaluating InsideTrack's coaching found a 12 percent gain in first-year retention that persisted through the end of students' second year of college.

These studies suggest that advising can, in some settings, improve college retention by addressing common barriers to success. But the effects are somewhat mixed. Some research, as shown in the InsideTrack study, indicates that advising is only effective in the long term when it is "intrusive." Although most advising programs generated small short-run effects, a few studies and interventions showed improvement lasting beyond the end of the intervention. The large variety of approaches to advising, some of which appear to work better in certain institutions and with certain groups of students, make it difficult to establish whether the results of one study might be replicated in other populations or settings. But the new research emphasis on more rigorous, causal evaluation has generated new interventions and ongoing studies that may provide more insights on college advising and other student services.

Helping with Competing Responsibilities

Although much of the research on student supports focuses on the "traditional" student, older "nontraditional" students, who are increasingly common on college campuses, face challenges over and above those of their younger peers. Most continue to work while balancing their studies with family responsibilities or concurrent employment that may be unrelated to their educational goals. Many have financial concerns that the financial aid system, originally designed to meet the needs of traditional-age college students, sometimes addresses poorly.[74] Although significant unmet financial need remains a major issue for nontraditional students, research suggests that nontraditional students do respond to financial aid policy by increasing their enrollment in college when offered financial aid. In fact, they appear to be more responsive to the offer of financial aid than younger students who are still financially dependent on their parents.[75] For more information on the effects of financial aid on student outcomes, see the article by Susan Dynarski and Judith Scott-Clayton in this issue.[76]

The Importance of Child Care Support

Beyond general academic programs for all students, colleges and universities are becoming more attuned to the particular needs of older students. Child care, for example, is a major barrier for many students, in terms of both cost and time. Women whose children are receiving child care off-campus have greater transportation expenses and less time to spend either on campus or studying.[77] In a recent survey by Public Agenda, 53 percent of students aged twenty-two to thirty with at least some college coursework said that family commitments were a major reason why they could not complete a degree or return to college.[78] Recently, researchers at MDRC explored the effects of giving a performance-based scholarship ($1,000 per semester) to low-income parents for adequate academic performance. For reaching fairly modest benchmarks (earning at least six credits and a "C" average), students were physically handed checks at the beginning, middle, and end of the semester.[79] Notably, many used the scholarship money for basic living expenses,

including child care and bus transportation. Ultimately, the program had positive effects on educational persistence and credit accumulation, perhaps because these nontraditional students used the funds to meet their own unique challenges.

Sarah Simmons and Sarah Turner specifically examined the effect of using financial aid to help students cover child care costs.[80] They hypothesized that the need to pay for child care could keep some students from pursuing postsecondary training. To test the theory, they examined the effects of a 1988–89 change in Pell Grant policy that allowed recipients to use up to $1,000 in child care costs in calculating grant amounts. Using the 1979 National Longitudinal Survey of Youth, they found that the policy change increased the college enrollment rate of women with children. They did not, however, find corresponding gains in educational attainment.

Other Types of Supports for Nontraditional Students

Beyond the supports already noted, colleges and universities could play a greater role in promoting the enrollment and success of nontraditional students. Providing more flexible schedules and programs, such as online options, could increase participation, as could more career-oriented programs tied to particular industries. Richard Voorhees and Paul Lingenfelter have argued that community colleges should create employment-related programs supported by the Workforce Investment Act's (WIA) One-Stop centers.[81] Such programs need not last as long as traditional community college courses but should be more comprehensive than the brief programs typically supported through the WIA.

Although many community colleges have formal relationships with employers in their region, all colleges should continue to increase their level of partnership with employers to support the postsecondary education of students who are concurrently employed. Beyond increasing the general amount of financial support, changing the timing of tuition collection and employer reimbursement could also have important benefits for nontraditional students. Currently, postsecondary institutions collect tuition payments before students enroll, but employers often do not reimburse employees until after they satisfactorily complete the course. Implementing more accommodating tuition payment policies and encouraging employers to adopt more flexible reimbursement policies could increase participation in higher education.[82]

Conclusions: Improving Student Support Systems

Although many institutions and policy makers are committed to the goal of improving student support systems, many questions about how to reach that goal remain unanswered. Even when a set of "best practices" has been endorsed, there is limited evidence to document the benefits of particular approaches. The limited resources of institutions and equally limited funds of students make it imperative for postsecondary institutions to improve student academic supports and other services.

Rethinking and Redesigning Remediation

As researchers work to understand the effects of remediation and how to improve it, debate is growing about whether colleges are placing too many students into remedial courses they do not need. Recent research from the Community College Research Center

finds that ACCUPLACER and COMPASS placement tests are not strong predictors of how students will perform in college.[83] The tests' single cutoff score, for example, does not allow for fine distinctions among skill levels and can thus lead to misassignment of students into remedial courses, particularly when they score right around the cutoff. Furthermore, the validity of the most common assessment instruments for placement is weak.[84] It may well be that fewer students need remedial courses than are currently assigned to take them. Placement exams are noisy measures of students' true ability, and so practitioners and researchers must consider carefully how to revise placement exams so that they measure more accurately the ability of all students and assign to remediation only those who definitively need it. As noted, research comparing students just above and below the remediation cutoff suggests that remedial and developmental courses may have negative effects for students who are more academically prepared;[85] meanwhile, students needing more remediation are more likely to experience positive effects as a result of being assigned to these courses.[86] Moreover, a recent evaluation of developmental course redesign efforts found that a redesigned remediation program that focused on "mainstreaming" remedial students by placing them directly in college-level courses had positive effects. This evidence suggests that one step in improving developmental education could be reforming remedial placement policies.

A second step could be to redesign remediation itself. Redesign efforts in Tennessee have raised awareness that remediation need not focus solely on skills that students did not learn in the past, but can instead identify and provide skills aimed at the future—for example, the skills needed to succeed in an academic major.[87] Instead of treating remedial education as a roadblock, institutions could think of it as an on-ramp to the college experience. Indeed, recent redesign efforts that identify areas in which students most need improvement view developmental education more as an academic support than as a curricular burden. Future redesign efforts can focus on differentiated delivery based on student skill and placement level as more institutions attempt to customize instruction to address specific student deficiencies.[88]

Avoiding the Need for College Remediation

As long as students graduate from high school poorly prepared for college, remediation will remain an important part of higher education. Rather than focusing solely on remediation, however, a better strategy might be to focus on policies that could lower the need for remediation while still providing students who are no longer in high school with the skills that will help them succeed in higher education. One promising policy that combines efforts to improve student advising while conveying the expectations of higher education is early placement testing. Several states, including Ohio, Kentucky, Oklahoma, and North Carolina, have begun to administer the remediation placement exam ordinarily given to college freshman to tenth or eleventh graders. Educators share results of the test with both students and their parents to inform all parties of the competencies that remain to be mastered. Together with their teachers and counselors, students can then decide what courses they need to take while still in high school to avoid college remediation.[89] California has implemented a similar Early Assessment Program, which informs high school juniors about their academic readiness for college-level work at California

State University campuses. One study finds that the program has reduced the need for English remediation by 6.1 percentage points and for math remediation by 4.1 percentage points.[90] Its authors conclude that rather than discouraging students for being poorly prepared, such programs encourage them to increase their academic skills while they are still in high school. But even though such early testing programs might reduce the need for remediation, other academic supports will likely still be needed to help ensure students' success.

Suggestions for Research

Future analysts should follow the lead of the more rigorous research studies we have noted and evaluate interventions using research designs, such as random assignment to the intervention, that allow for causal analysis.[91] With resources for remediation programs severely limited and the need for such programs growing, one approach would be to assign participants to oversubscribed programs by lottery and thereafter track the applicants who do and do not get into the program.

Researchers should also make use of new data sources. Following work done by Jill Constantine and her colleagues, analysts should tap into state and university administrative databases.[92] Surveys and program information could supplement such data to lead to more comprehensive research on the effects of programs. In a review of remedial education, the Education Commission of the States found that most states collect data on student participants, although usually only on recent high school graduates, not all students. To develop a complete picture of student performance and to target strategies to particular students, states should disaggregate data by categories such as age, race, gender, and level of remediation.[93] Studies should also collect information on program costs to allow researchers to conduct full cost-benefit analyses in the future.

To distinguish the effects of different services or to see how different combinations of services affect student outcomes, researchers should choose research designs that allow them to estimate separately the effects of different parts of an intervention. Although such designs may require large sample sizes and complex randomization plans, they would shed light both on what types of services make programs most effective and on how interventions with small effects could be combined for a larger impact. Finally, using careful research designs and larger sample sizes, future evaluations should attempt to estimate how the effects of an intervention differ by type of students; such work would address researchers' current concerns about a "one size fits all" approach to remediation.

Remedial courses and student support services are intended to help students in the transition to college, as well as to promote future academic success. Finding ways to improve the quality and delivery of these support systems remains a key challenge for administrators and practitioners, as does identifying the specific components of successful interventions. The costs and benefits of such programs must also be carefully considered, as cost-effective innovations are imperative for both postsecondary institutions and their students during uncertain financial periods. Given the range of challenges facing college students today, particularly nontraditional students or those academically underprepared for college, targeting and improving support systems remains a critical step in increasing college degree attainment in the United States.

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