



Postsecondary Education in the United States

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The Future of Children

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Postsecondary Education in the United States: Introducing the Issue

Lisa Barrow, Thomas Brock, and Cecilia Elena Rouse

Since the introduction of the GI Bill in 1944, college has been part of the American dream, in large part because it is viewed as a ticket to economic security. Currently, about 21 million individuals attend a postsecondary institution, and the vast majority of high school students aspire to earn a bachelor's degree or higher.¹ While the popular image of college may be dominated by Ivy League schools, flagship state universities, and elite liberal arts colleges, in fact only a minority of students attend such institutions. Many go to less-selective regional four-year colleges and universities and vocational institutions, and nationwide close to 40 percent are enrolled in open-access community colleges. A small but growing number of students are working toward college degrees mostly or entirely online.

Students pursue postsecondary education for a variety of reasons. Some are looking for a broad liberal arts education, while others are more career focused. Still others enroll to take only a class or two to keep up their skills or simply for the joy of learning. U.S. postsecondary institutions serve not only those students with the best academic

preparation but also those who were not well served in the nation's elementary and secondary school system and need a second chance. This range is reflected in the differing degrees of "college readiness" among entering postsecondary students and in the increasing proportion of students who are "nontraditional" in that they are older, from less advantaged families, financially independent of their parents, parents themselves, or working while going to school.

As enrollments in postsecondary education have increased, so have private and public investments in education. Federal, state, and local governments combined contribute about 1 percent of the nation's gross domestic product (\$160.9 billion in 2011) to postsecondary education, largely predicated on the belief that it addresses long-standing economic inequalities and leads to economic growth.² Namely, investment in education benefits the individual in many forms, including higher lifetime income, and benefits society by increasing labor force productivity, which in turn generates faster economic growth. Growing evidence backs these claims. For example, individuals with a bachelor's degree earn 50 percent more during their

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lifetime than individuals with no more than a high school diploma, and their unemployment rate is less than half as high.³ Research also suggests that college graduates have higher job satisfaction and better health outcomes than those without a college degree. Finally, economists such as Enrico Moretti have documented significant benefits to the broader society: workers earn more in cities with higher proportions of college graduates, suggesting that more educated workers generate positive “spillovers” to other workers. In fact, he documents that cities with more highly educated populations are hubs of innovation and experience faster economic growth than those with less educated populations, again generating positive spillovers to all residents.⁴ Increased globalization and advances in production technology suggest that postsecondary education will become even more important to the economic security of individuals and society in the future, as suggested by the work of economist David Autor. He has documented that the occupations that have grown over the past two decades require more “non-routinized” skills, many of which are associated with postsecondary education.⁵

Despite these data, critics are starting to ask whether current high levels of investment in postsecondary education are still worth it. Nowhere is this question more starkly voiced than by Peter Theil, cofounder of PayPal, who two years ago began offering young entrepreneurs up to \$100,000 *not* to go to college. His reasoning is that traditional postsecondary institutions do not teach the critical skills that individuals need to succeed in the “real world” of business. Because timing is everything in business, Theil argues that young people with good ideas should not wait an additional two to three years to complete a degree before fully developing a new product.⁶

Others agree that postsecondary education may not be worth it, but their reasons primarily concern the relationship between the high price of postsecondary schooling and the future return, especially in the form of employment and income. For example, based on the Consumer Price Index, overall prices increased by an annual average of 2.4 percent between 2001 and 2011, while college tuition and fees grew by an annual average of 6.8 percent—the highest among all major expenditure categories, including energy (6.6 percent) and medical care services (4.3 percent).⁷ Many critics argue that much of the increased cost of postsecondary education is unnecessary and the result of institutions becoming “inefficient” in the sense that they could provide a better quality education for the cost or could provide the same quality education at a lower cost if they simply reorganized. Critics contend that, among other factors, this inefficiency arises because most states finance their public institutions according to the number of students they enroll rather than the number who complete their course of study, and because these institutions have been slow to adopt technology that provides or enhances teaching. The result, these critics say, is a bloated, expensive, and inefficient system in which half of all students who start at a postsecondary institution fail to complete a degree or certificate within six years.⁸

Finally, rising student debt is a subject of widespread concern. While increases in grant aid have helped offset the increases in cost, more and more students (and sometimes their parents) are financing college by taking out large student loans. In some cases, the levels of debt are simply too high relative to what students can earn after leaving college, particularly early in their careers. As a result, some analysts suggest, many young people

are delaying marriage or starting a family, still living with their parents, or putting off buying a home.⁹ In the eyes of some critics, these costs outweigh the benefits that a college education provides.

Individuals with a bachelor's degree earn 50 percent more during their lifetime than individuals with no more than a high school diploma, and their unemployment rate is less than half as high.

And so policy makers at all levels are faced with several challenges regarding postsecondary education policy. For example, efforts to broaden access have been so successful that many students arrive at college unprepared for the work. This lack of preparation results in large expenditures by state and local government—perhaps as much as \$3 billion annually—to help these students acquire the skills they need to succeed in school.¹⁰ The large numbers of students in developmental education also raise questions about its efficacy and about what high schools should do to better prepare students for postsecondary class work.

Financial aid raises another set of challenges. In fiscal year 2011, 9 million students received Pell Grants at a cost to the federal government of \$36.5 billion.¹¹ While acknowledging that these federal grants have been increasingly important as state support of public institutions has declined, policy makers want greater assurance that the investment

is worthwhile. One result has been increased efforts at oversight and regulation, especially of the for-profit sector and public institutions that have the lowest graduation rates. Innovative ways of financing institutions that go beyond enrollment to focus on completion (or “quality”) are also attracting growing interest, as is the development and adoption of new technology that may help curb costs.

The articles in this issue of the *Future of Children* are designed to address these and some of the other most pressing concerns in postsecondary education. Before reviewing their major points and conclusions, however, we emphasize that space constraints made it impossible to cover many important topics. For example, we do not discuss graduate education, compare the U.S. postsecondary system to those of other countries, or focus explicitly on community colleges. We hope that this issue will be viewed as the beginning of a dialogue on addressing the challenges facing postsecondary education rather than as an end in itself.

What Have We Learned?

Although each article in the issue opens with a full summary, in this section we briefly highlight some of the findings we think are the most important.

Overview of American Postsecondary Education

In their overview, Sandy Baum of George Washington University, Charles Kurose, an independent consultant to the College Board, and Michael McPherson, of the Spencer Foundation, trace the evolution and growth of the postsecondary education sector over the past fifty years. The push for expansion and diversity in the 1960s and 1970s, they write, resulted from a belief in the value of education for the nation and the desire

to broaden access to higher education to students from different ethnic, racial, and socioeconomic backgrounds. The growth in community colleges and other “open access” institutions also gave a second chance to those who had not been well served in elementary and secondary school. These expansions were made possible by increased public sector support from states and the federal government. The efforts to improve access were highly effective: the share of high school graduates attending college rose from 45 percent in 1960 to 70 percent in 2009. The college population also became more diverse, with increasing numbers of female, low-income, older, and minority students. The number of students enrolled part-time also rose. This shift away from the so-called traditional student has meant that institutions have had to accommodate a wider range of student preparation for college-level work, provide other kinds of supports (such as child care and financial aid), and offer more heterogeneous courses.

Tuition has risen very rapidly in recent years. The authors highlight this problem, but point out that the highest prices receive disproportionate attention and that growth in grant aid has caused the net prices most students actually pay to rise more slowly than the sticker prices. At the same time, the share of funding that the states provide to public postsecondary institutions, once a large proportion of their support, has been in decline over the past three decades (dropping from 44 percent in 1980 to 22 percent in 2009). As a result, net funding per student has declined, placing further upward pressure on tuition despite an increasing federal role. The authors explain the different components underlying the cost of providing a postsecondary education and the efforts that are under way to curb costs, including increased reliance on technology to

help with instruction. They caution that while policy makers and education leaders should continue to seek ways to increase productivity in higher education, it may not be easy to achieve dramatic cost reduction without compromising quality.

Is College Worth It?

Against a backdrop of skepticism regarding the value of a postsecondary education, Philip Oreopoulos and Uros Petronijevic, both of the University of Toronto, present data on the various costs and benefits of attending college. Specifically, the authors think of college as an investment in which an individual makes financial sacrifices (including tuition payments and forgone earnings) in the near term in exchange for benefits (or returns) in the future. In this framework, students will choose to attend college if the costs—including the “opportunity cost,” or the earnings and other activities that may be forgone in order to attend school—are smaller than the expected benefits, such as higher lifetime earnings, greater likelihood of employment, and improved health. Many factors, however, can make this seemingly straightforward decision more difficult. For example, at the time they must make the decision, students cannot know with certainty about job prospects once they finish. Some students may learn after enrolling that they would prefer not to continue in schooling. Further, the formal economic model assumes that all potential students can borrow against their future incomes and that they do not mind acquiring large amounts of debt to do so. Some individuals may be “credit constrained” in that they cannot borrow for college at competitive rates (sometimes because they have reached their credit limits). And some students are averse to taking on too much debt and would prefer to forgo schooling so that they can work and

avoid having to repay loans at a later date. Finally, the authors emphasize how the simple model overlooks just how difficult it can be for prospective students to navigate the U.S. financial aid system, which can deter them from applying for aid and, as a result, college. For any of these reasons, students may underinvest in their education by deciding either not to enroll in the first place or to leave before completing their schooling.

With this model in mind, the authors then present data detailing that the average college graduate earns \$1.2 million net of tuition over a lifetime (in net present value terms) compared with \$780,000 for a high school graduate, as well as other expected economic benefits. They also highlight the nonpecuniary benefits of college, such as more independence and opportunities for creativity and more social interaction; evidence also suggests that college graduates enjoy better health than nongraduates. Although some researchers and policy makers worry that the relationships between education and better outcomes are not causal, the authors document several studies, conducted over time, that use credible strategies to identify the causal relationship between education and income and consistently find evidence that more education leads to higher earnings. While these economic benefits of postsecondary education are, on average, substantial, the authors document how these expected returns vary across occupations and may differ across institutions as well, raising yet other dimensions for students to consider when making their schooling decisions.

Finally, Oreopoulos and Petronijevic caution that postsecondary education, like many other investments, does not guarantee a positive return. They note that the “right” answer to whether to attend college will

differ for students depending on a variety of factors. They conclude, however, that on average the financial benefits of a postsecondary education outweigh the financial costs, especially for those students who make informed decisions.

Financial Aid Policy: Lessons from Research

As several authors note, making good decisions about how much to spend on a college education, where to enroll, and how to finance that education is a complex endeavor. Further, all agree it is critical that prospective students have the best information available with which to make informed decisions. And yet, as explained by Susan Dynarski, of the University of Michigan, and Judith Scott-Clayton, of Columbia University, the array of financial aid available to students is so complex that it can interfere with the effectiveness of the student aid. Federal involvement in postsecondary education that began with Title IV of the Higher Education Act of 1965 established a small program to help colleges to identify and recruit students with “exceptional financial need.” Since then, Title IV aid has expanded and is now available to assist older students, those attending part-time, and middle-income families through Pell Grants, Stafford Loans, and Federal Work-Study. In addition, the expansion of tax credits, such as the American Opportunity Tax Credit, has made federal aid available for even high-income families. All told, various forms of aid combined amount to about \$13,000 per (full-time equivalent) student.

While federal and state governments have increased efforts to help make college affordable for more students, one area where education policy seems to complicate the application process is the Free Application

for Federal Student Aid (FAFSA). Completion of the FAFSA, which is required for students to be eligible for any federal (and most other) financial aid, is daunting and by itself may keep some students from attending college. Further, the complexity of predicting one's own aid eligibility from federal, state, and institutional sources makes it difficult for students to know what they can afford or how much in loans they might need to attend any particular institution. Thus, making the aid application and eligibility determination process simpler and more transparent to individuals may increase the number who enroll in college as well as help some make better decisions about where to attend and how much debt to take on. Dynarski and Scott-Clayton note some evidence that awarding grant aid with payments tied to academic achievement appears to improve college outcomes relative to aid awarded without such incentives. Even less may be known about how student loans affect student outcomes, although loans make up a large share of overall student aid.

Finally, the authors discuss some of the potential unintended consequences of financial aid policy on individual and institutional behavior. As one example, former U.S. Secretary of Education William Bennett popularized a concern that by lowering the effective price of college for some students, financial aid might induce institutions to increase tuition costs overall. Dynarski and Scott-Clayton cite evidence suggesting that while some selective nonprofit institutions may reduce institutional aid and some for-profit institutions may increase tuition in response to increases in financial aid, these responses have not been observed at public institutions where most Pell Grant recipients attend college.

Student Academic Supports

While financial cost can be a hindrance to successful college completion, inadequate preparation is another major challenge, especially at less-selective and open-enrollment institutions. According to data from the National Center for Education Statistics, only about one-quarter of seniors complete academically rigorous high school coursework that would prepare them for college. Traditionally, this lack of preparation has meant that large numbers of students begin their college career enrolled in developmental courses. Eric P. Bettinger, of Stanford University, and Angela Boatman and Bridget Terry Long, both of Harvard University, discuss what is known about the effectiveness of developmental education as well as other academic programs to help struggling students complete their studies.

The authors emphasize that one of the challenges in studying the effectiveness of developmental education is that simple comparisons of outcomes will generally result in an overly negative estimate of its effectiveness because students placed in developmental education courses are, by definition, less prepared academically than those not placed in such courses and therefore may have worse outcomes for reasons unrelated to the effectiveness of their (developmental) coursework. At the same time, a study in which some eligible students are randomly placed into developmental education classes and other eligible students are randomly assigned to regular classes would be difficult to implement. The authors make use of studies that exploit the fact that institutions typically have a predefined cutoff on placement tests that determines whether a student is required to take developmental classes (an evaluation strategy known as “regression discontinuity”). This

technique assumes students who *just* pass out of such requirements are, on average, similar to those who *just* miss passing, with any differences between the two groups being due to random influences that occur with any testing situation (such as a student not feeling well or being distracted on the day of the test). By comparing the outcomes of those just above and just below the test score cutoff, one can generate a statistically unbiased (valid) estimate of the impact of the program.

In their review, the authors report that the benefits of developmental courses differ widely by state, institution, student background, and academic preparedness, making it difficult to judge whether such courses are beneficial on average. These mixed results have led researchers and policy makers to try to better understand which students benefit and which types of programs are the most effective. To date, the research suggests that developmental education programs that accelerate the pace of instruction and those that combine basic skills acquisition with college-level coursework may be the most promising and merit further study. The authors also argue that the instruments and procedures used to place students into developmental education could be improved.

Finally, the diversity of students on campus and the competing responsibilities of family, schoolwork, and employment mean that the success of some students may depend on the ability of institutions to offer support services beyond the traditional academic supports. Some institutions are thus offering peer and faculty mentoring, tutoring, time management workshops, enhanced student advising, and child-care support or services. Unfortunately, the research on the effectiveness of these supports is mixed, highlighting

the importance of continued efforts to strengthen existing services and to develop and test new approaches to learn what works best for which students.

High School to College Transitions

It seems obvious that preparation for college should take place mainly in high school, and not after students arrive at a college campus. However, as Andrea Venezia and Laura Jaeger, both of WestEd, note, many students arrive on college campuses unprepared to tackle college-level work, leading to increased discussion of what it means to be “college ready.” The authors describe recent efforts to define what it means to be “college ready” and to improve the transition from high school to college.

While traditional measures of readiness, such as the SAT and ACT, focus on reading, writing, and math skills, the authors note that researchers are increasingly emphasizing the importance of noncognitive skills such as resilience and persistence. The authors point to many factors that underlie the large numbers of students unprepared for postsecondary work, including large disparities between the instruction and services offered by high schools with high concentrations of students in poverty and high schools with more economically advantaged students. They also note the importance of nonacademic variables, such as peer influences and expectations and conditions that encourage academics. Finally, they describe research suggesting that students who “undermatch”—that is, who attend colleges and universities that are less selective than those they are qualified to attend, based on their high school grades and other criteria—perform worse than comparable students who enroll at more selective institutions. The research underscores the need to help

all students find the right institutional “fit” in terms of cost, geographic location, and academic rigor.

Interventions to improve college readiness offer a variety of services from academic preparation and information about college and financial aid, to psychosocial and behavioral supports, to the development of noncognitive skills including organization, anticipation, persistence, and resiliency. The authors highlight federal programs, such as Upward Bound, Talent Search, and Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP), which are some of the larger and better-known programs, while also noting that many more students qualify for these programs than can be served with available funding. The authors also discuss more systemic programs, such as Middle College High Schools (MCHS) and Early College High Schools (ECHS), and review efforts to allow high school students to take college classes (known as dual enrollment) and to better align the assessment tools and curricula used by high schools and postsecondary institutions.

The evidence base on the effectiveness of these efforts is limited, but the authors report that the evaluations of precollege support programs, such as those that form the federal TRIO programs (including Upward Bound and Talent Search), generally show small impacts. This finding should not be surprising, given that the programs do not fundamentally change the high school experience of the students. The more systemic programs like MCHS and ECHS show mixed results. Dual-enrollment programs show promise, but the evaluation designs do not use a randomized control group and may overstate the results. The authors argue that current national efforts to

define and implement curriculum standards and expectations that carry from kindergarten through high school and align with college are critical if the nation is to make progress in better preparing students for postsecondary education.

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For-Profit Colleges

For-profit colleges are the fastest-growing segment of postsecondary education providers. As noted by authors David Deming, Claudia Goldin, and Lawrence Katz, all of Harvard University, this sector accounted for about 4 percent of enrollment in Title IV-eligible institutions in 2000 and grew to nearly 11 percent by 2009. For-profit institutions are responsible for nearly one-third of the growth in postsecondary school enrollment and degrees over the past decade.

Although policy makers and educators in the public and private nonprofit sectors sometimes view for-profit institutions with suspicion, they should not be dismissed out

of hand. Notably, these institutions enroll a disproportionate share of low-income students, minority students, and those who are ill prepared for college. Further, they can be quick to adapt their curricula and programming to meet local labor market needs, making them valuable resources for workers seeking to train for jobs in growing sectors. As a result of this “nimbleness,” for-profit institutions may spur innovation and efficiency in higher education. The authors also note that while public community colleges may provide equal or better education at lower cost, state and local budget pressures may limit the ability of public institutions to serve all who would like to enroll, suggesting that demand for for-profit institutions will continue to grow.

Despite the rapid growth of for-profit institutions, relatively little is known about whether students benefit from having attended them. Although this literature is nascent, as the authors emphasize, it suggests that for-profits are relatively successful with well-defined, short-duration programs but do not do well in terms of completion rates, student loan default rates, and labor market outcomes for seekers of associate’s and higher degrees compared with community colleges and nonselective four-year colleges. These trends are disturbing, especially considering that for-profit institutions rely heavily on federal student aid for their revenue. According to one study, the total cost of attending a for-profit institution (taxpayer subsidies plus tuition and fees) is about \$15,000 more than attending a community college even though community colleges are more heavily subsidized by taxpayers than for-profit institutions. To be economically worthwhile, therefore, for-profit institutions need to generate economic returns that are substantially greater than those required of community

colleges. To date, the existing research suggests that the costs to students (and society) of attending a for-profit institution likely outweigh the benefits.

Because of the mixed outcomes paired with the high total cost of attendance at for-profits, the authors argue that strong oversight is warranted regarding whether students are sufficiently likely to complete their course of study and subsequently earn enough to justify the investment and pay back their loans. In addition, it is critical that potential students have complete and objective information about the costs and expected benefits available to them when they are making enrollment decisions. More generally, the challenge for public policy is to design incentives for these institutions to improve quality while also maintaining adequate access for those students not well served by other sectors of higher education.

E-learning in Postsecondary Education

Advances in technology have transformed American life in so many ways that it is only natural to ask how online instruction and other innovations might improve access, lower costs, and (possibly) increase quality in postsecondary education. As discussed by Bradford Bell and Jessica Federman, both of Cornell University, while most students continue to attend “traditional” classes, more than 31 percent of U.S. college students took at least one online course during the fall 2010 term. More generally while online courses are one aspect of “e-learning,” technology can be incorporated into the classroom in so many ways that just what constitutes e-learning is ill-defined. As an example, researchers and educators employ about fifty distinct terms encompassing the concept, such as online learning, distance learning, computer-assisted instruction,

computer-based instruction, and computer-based simulation—often inconsistently—making what has been learned in the field difficult to summarize. Bell and Federman employ the general term e-learning to encapsulate the very general “instruction delivered through computer technology.”

Bell and Federman examine three key questions regarding e-learning. The first is whether it is as effective as other delivery methods, such as traditional instructor-led classroom instruction. The challenge here is one of comparing an e-learning classroom to a traditional classroom experience in a way in which the only pedagogical difference is the mode of delivery and in which the characteristics of the students are the same, on average. In other words, it is difficult to construct a causal estimate of the impact of e-learning on student outcomes that is untainted by other factors. To make sense of the literature, the authors rely on several meta-analyses that attempt to summarize the literature by aggregating findings from multiple studies. While the methodology is only as good as the quality of the underlying studies—which is not always easy to discern—Bell and Federman argue that such studies provide the most comprehensive assessment of the impact of e-learning. They conclude that e-learning produces outcomes equivalent to other ways of teaching when instructional conditions are held constant.

Having established that e-learning can be as effective as traditional classroom instruction, the authors next document how some of the features of e-learning—such as the content of the material, the sense of realism that e-learning creates, the characteristics that determine the degree of and type of interaction between students, and the richness, or “bandwidth,” that determines the

students’ ability to communicate with other students and the instructor in the class—can all influence the effectiveness of e-learning programs. Importantly, these are the features that can be configured differently for different types of learners to most effectively reach them. Finally, the authors address barriers to the adoption of e-learning in postsecondary education, such as concerns about fraud and cheating, uncertainties about the cost of e-learning, and the unique challenges faced by low-income and disadvantaged students, all of which have the potential to undermine the adoption of e-learning instruction.

Overall, the authors conclude that e-learning can be an effective means of delivering postsecondary education. They also urge researchers to examine how different aspects of these programs influence their effectiveness and to address the numerous barriers to the adoption of e-learning in higher education.

Improving Productivity in Broad-Access Public Postsecondary Education

With increasing tuition paired with stagnant growth in median income, many policy makers and parents are calling for institutions of higher education to improve productivity. Namely, they challenge institutions to find ways to cut costs—which should translate into lower tuition—without sacrificing access, quality, or completion rates. Davis Jenkins and Olga Rodríguez, both of Columbia University, examine research on how “broad-access” institutions—community colleges and less-selective public four-year colleges and universities—might be able to do so. Unfortunately, as the authors review the research on the ways institutions can improve productivity, it becomes clear that doing so will not be easy. For example, although one can easily measure the number

of degrees completed, it is much less clear how to measure whether the quality of degrees produced has changed. Further, colleges do not systematically and routinely collect data on all inputs involved in producing degrees and certificates, such as faculty time use and student effort.

Research indicates that the strategies broad-access institutions have relied on to cut costs in the past—such as using part-time instructors and increasing student-faculty ratios—may in fact *reduce* productivity and efficiency. Moreover, the limited evidence suggests that some of the most popular strategies for improving student success, such as Upward Bound and enhanced student services, are not cost-effective. New strategies to cut costs and improve college success are therefore imperative. Some believe that redesigning courses to make use of computer-assisted instruction and other automated tools will lead to better outcomes at lower cost, although the evidence on the ability of these technologies to improve efficiency is mixed. Studies on organizational effectiveness in and outside of higher education indicate that, to improve performance substantially, colleges must go beyond redesigning courses to change the way they organize and manage programs and supports along the student's "pathway" through college. A growing number of institutions are exploring this approach, but whether it will lead to better student outcomes or reduce the cost per completion is not yet known.

State and federal policy makers have also tried motivating colleges to improve student learning and completion by basing funding not only on how many students they enroll but at least in part on how many they graduate, transfer, or place in jobs. To date these policies have not been associated with

changes in college practice, but that may be because such a small portion of funding hinges on performance. As a result, some states are beginning to increase the proportion of funding tied to student outcomes.

As policy makers push colleges to lower the cost per graduate, they must take care to avoid providing incentives for schools to restrict access (and skim off the top students) or to lower standards and reduce the quality of the education provided. As yet, there are no commonly accepted methods for measuring quality of outcomes in higher education, even within particular sectors. Although these measures are imperfect, Jenkins and Rodríguez argue that policy makers and institutions should capitalize on advances in research that measure the economic value of postsecondary education as an indicator of quality. At the same time, colleges and universities must redouble efforts to define learning outcomes and measure student mastery. It is only by improving measurement that institutions will be able to achieve the twin goals of lowering costs without affecting quality and access.

Where to Go from Here

The articles in this issue suggest that postsecondary education is at a crossroads. On one hand is the remarkable expansion in college access and the implementation of numerous policies and programs designed to help students succeed. On the other hand are the realization that far too many students who enter the nation's colleges and universities fail to earn credentials, and the fear that costs are spiraling out of control. Is it possible to preserve access, improve student outcomes, and keep college affordable?

While there are no easy fixes, this issue of the *Future of Children* suggests several areas

where policy makers and practitioners can make progress. Perhaps the place to start is to reach consensus on what it means for students to be college ready. Efforts under way in some states to align primary and secondary education systems with post-secondary education systems and develop common standards for high school graduation and college entry are steps in the right direction, but they need to be accompanied by meaningful changes in teaching and assessment. High schools need to place greater emphasis on developing both the critical thinking skills and the noncognitive skills needed to succeed in college and in a career. Likewise, community colleges and other less-selective institutions need to reexamine policies and practices that consign large numbers of students to developmental education courses. To make the courses more effective, some states and institutions try to integrate basic English and math instruction into occupational training programs or to accelerate the pace of developmental education by introducing new curricula and pedagogy, including computer-aided instruction. There is no shortage of good ideas for reforming developmental education, but more evaluation is needed to guide policy makers and practitioners on which approaches are most effective and cost-efficient.

Another theme that arises across several articles is the need for objective and transparent information to help students in deciding whether to go to college, where to enroll, and what program to pursue. Lack of objective information on completion and employment outcomes, for instance, hinders students' ability to choose among various institutions and programs. Similarly, the daunting financial aid application process and the lack of transparency on how financial aid really works makes it difficult for all but those students

from the wealthiest families to know how much they will have to pay out-of-pocket to attend a particular institution. Student-loan financing, and the variety of options available for students and parents to consider, is also complex. As a result, many are discouraged from applying and others fail to consider more selective institutions for which they are qualified but believe they cannot afford to attend. Simplification of the financial aid application process may help students and families make better use of existing aid programs and improve their overall impact on postsecondary access and completion.

Several articles also discuss the need to think further about the role that technology might play in supporting students and reducing, or at least holding the line on, college costs. Many colleges and universities are already using automated programs to augment traditional counseling and advising programs staffed by faculty members or student services workers. Automated online course registration programs can take into account factors such as a student's past academic performance and degree goal to recommend courses that will help the student to feel appropriately challenged and to earn a degree in the shortest amount of time—much like online retailers make recommendations of books and movies buyers might like based on previous purchases. Computers can also be programmed to provide “early warnings” to students and their advisers when students receive poor midterm grades or show other signs of academic trouble. Unfortunately, less is known about the effectiveness of these new systems in promoting student achievement. More generally, efforts to create Massive Open Online Courses (MOOCs) hold great promise for extending college opportunities to many more students at lower cost than traditional classroom instruction. Although

many educators rightly worry about the quality of such courses and the loss of face-to-face interaction, MOOC proponents counter that the courses are often taught by the nation's best professors and that the formation of vibrant communities via the Internet can provide educational experiences that are just as stimulating as conventional classroom instruction—or maybe even more so, given the potential of MOOCs to engage students from across the globe in online discussion forums. Educators are only beginning to understand how online communities function and how they might be harnessed to support college access and completion. Given the high initial costs of developing effective e-learning opportunities combined with the potentially lower cost of employing such strategies, the public sector can play a critical role in encouraging the development of the technologies and rigorously studying their effectiveness. It seems clear that e-learning is here to stay; the question is how to ensure the instruction meets high standards and if and how it should be integrated with more traditional, campus-based learning.

Finally, the economic downturn has returned attention to the economic benefits and costs of a postsecondary education. Policy makers, parents, and students are rightfully asking if college is worth it and are demanding more accountability from postsecondary institutions. And yet the intense focus on relatively short-term measurable benefits and costs may run the risk of ignoring the less-tangible benefits of a postsecondary education. These benefits include higher-order problem solving, critical thinking, and creativity, as well as experience working with others who are different, which makes for a better functioning workplace and society. Some of these less-tangible benefits can have a payoff in the short term, while others may take more time to develop. In both cases, these benefits can have long-lasting and important positive impacts on individuals and society. A vibrant postsecondary sector is critical to the future of the United States; the delicate challenge for policy makers is to build on its current strengths while balancing many competing objectives.

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An Overview of American Higher Education

Sandy Baum, Charles Kurose, and Michael McPherson

Summary

This overview of postsecondary education in the United States reviews the dramatic changes over the past fifty years in the students who go to college, the institutions that produce higher education, and the ways it is financed. The article, by Sandy Baum, Charles Kurose, and Michael McPherson, creates the context for the articles that follow on timely issues facing the higher education community and policy makers.

The authors begin by observing that even the meaning of college has changed. The term that once referred primarily to a four-year period of academic study now applies to virtually any postsecondary study—academic or occupational, public or private, two-year or four-year—that can result in a certificate or degree. They survey the factors underlying the expansion of postsecondary school enrollments; the substantial increases in female, minority, disadvantaged, and older students; the development of public community colleges; and the rise of for-profit colleges. They discuss the changing ways in which federal and state governments help students and schools defray the costs of higher education as well as more recent budget tensions that are now reducing state support to public colleges. And they review the forces that have contributed to the costs of producing higher education and thus rising tuitions.

The authors also cite evidence on broad measures of college persistence and outcomes, including low completion rates at community and for-profit colleges, the increasing need for remedial education for poorly prepared high school students, and a growing gap between the earnings of those with a bachelor's degree and those with less education. They disagree with critics who say that investments in higher education, particularly for students at the margin, no longer pay off. A sustained investment in effective education at all levels is vital to the nation's future, they argue. But they caution that the American public no longer seems willing to pay more for more students to get more education. They therefore urge the higher education community to make every effort to find innovations, including creative uses of information technology, that can hold down costs while producing quality education.

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This overview of the American higher education system offers a broad picture of who pursues education beyond high school and for what purposes. What schools do these students attend, for how long, and with what result? Who pays for all this education? In answering these questions, our aim is to provide a useful context for readers as they pursue understanding of the particular topics discussed in more depth in the rest of this issue of *Future of Children*.

Our focus is undergraduate education, and we leave aside other important aspects of some higher education enterprises, including research, graduate, and professional education, and commercial sports entertainment. Because our major interest is in public policy, we give primary attention to the sectors where governments' role in finance is greatest: public colleges and universities and the for-profit education industry. These are also the institutions attended by more than 80 percent of postsecondary students.¹

Over the past fifty years, the American college scene has changed dramatically. For example, the bulk of formal job training in this country now occurs in places called *colleges*. The great majority of U.S. high school graduates now pursue some form of education after high school, a path that has become substantially more common over time. These days, more undergraduate students are enrolled in community colleges than in public universities.² And among students who are attending private institutions, close to a third of them now attend places run for profit.³

None of these things was true fifty years ago. The size and scope of the changes suggest that a brief review of what American higher

education was like in the early 1960s, and of all that was about to happen to it, would not be out of place.

Changing Context for Higher Education

The early 1960s was a time of quiet ambition in American higher education. The baby boomers were beginning to overcrowd grade schools and high schools, but the tidal wave of postwar births had not yet hit college. Undergraduate education was operated mainly through private nonprofit colleges and through public four-year institutions financed by state governments. Degree-credit enrollment in for-profit colleges was too small to track. The Soviet Union's lead in the space race (Sputnik was launched in 1957) strengthened the American will to develop a more educated population. But despite the modest inroads made by Dwight Eisenhower's National Defense Student Loans, public consensus held that the federal government had no continuing responsibility to pay for college. Total tax revenues as a share of personal income were about where they are now, but there was then no strong national movement to push taxes down. Indeed, looking at state, local, and federal taxes and spending combined, the national budget was in surplus, with taxes and spending amounting to 26 percent and 23 percent of gross domestic product, respectively.⁴

With a prosperous economy and relatively small cohorts of students graduating from high school (the high school class of 1960 was born in 1942, when many would-be fathers were in the service), state investments in expanding college opportunity seemed both smart and fiscally feasible—at least for those whose planning horizons were short enough to overlook the impact of the baby boom. Behind the broad optimism of the early

1960s, with the public's widely shared belief in the efficacy of government and confidence in the value of higher education, were less encouraging realities. Access to higher education was radically unequal, whether measured by family income or by racial and ethnic background. And the opportunities for second chances in education, now taken for granted in American higher education, were far less abundant fifty years ago.

It was in this environment that Clark Kerr, president of the University of California, put forward his bold "master plan," which promised to put a publicly funded college experience within financial and geographic reach of every high school graduate in the state. This ambitious plan was in line with other governmental commitments undertaken in that post-World War II era, such as the Interstate Highway System in the 1950s, the space program in the early 1960s, and Medicare in 1965. The states, following California's example, took the lead on the commitment to higher education, but the federal government soon stepped forward as well, first with the Higher Education Act under Lyndon Johnson in 1965 and then with the introduction of the Basic Educational Opportunity Grant program (later renamed Pell Grants) under Richard Nixon in 1972.

By the mid-1970s, many of the major elements of governmental provision and support for higher education were in place, with all states operating systems of public universities, colleges, and community colleges with tuitions subsidized by state appropriations. The federal government provided grant aid to students of all ages, with grant awards keyed to the ability of students and families to pay. States too began to develop programs of need-based aid (and later merit aid) awarded directly to students, supplementing state

operating subsidies to public institutions. And the federal government expanded credit availability by offering loans to students at subsidized rates and putting the cost of defaults on the federal books.

The pattern of expansion in numbers of students and in governmental support that began in the early 1960s continued in the following decades. Growth in student demand fed increased state and federal spending, even as new help in paying for college fed enrollment growth. Expanding student populations, changes in the range of offerings students wanted from colleges, and novel forms of governmental support for higher education increased the size, the number, and the kinds of institutions providing undergraduate education services. These three strands of evolution—in students, in finance, and in institutions—intertwined in complex ways. In focusing first on student access and success, then on paying for college, and last on producing college education, we also pay attention to the interlinking of these three strands.

Student Access and Success

A half-century ago, college was not seen as the natural next step for most American young people who finished high school. American factories were thriving, unions were strong, and a high school graduate could reasonably expect to move right into a stable job that would support a family and allow the purchase of a car and a house. But the idea of postsecondary education was starting to catch on, and by 1960, about 45 percent of recent high school graduates began college somewhere.⁵

By 2009, that picture had changed. Factory jobs had become scarce, the cultural expectation that women would stay at home while men were breadwinners had faded, and

society increasingly recognized an obligation to open educational opportunities to members of disadvantaged minorities. By 2009, 70 percent of high school graduates enrolled in some form of postsecondary program shortly after completing high school, and the range of options available to them had become much broader. The absolute number of high school graduates was also expanding over much of that period as the baby boomers and then their children arrived at the college door. As a result of a growing population and higher attendance rates, the number of people enrolled in postsecondary education grew spectacularly, from about 4 million in 1960 to more than 20 million in 2009.⁶

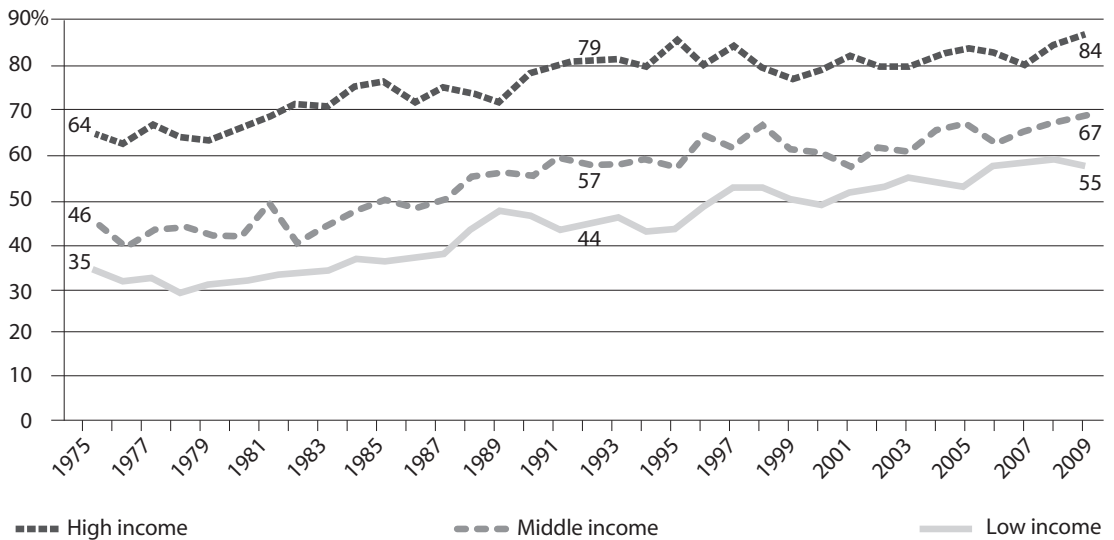
Over those fifty years, big changes had occurred not just in the numbers of people who went to college, but also in who went. In 1960, only 37 percent of the students enrolled in degree-granting colleges and universities were women; by 2009, women's share of enrollment had grown to 57 percent.⁷ The changes in enrollment patterns by gender have generated considerable discussion about the increasing opportunities open to women, as well as concern over the extent to which men are falling behind. Aside from these social issues, however, this change has not created significant new challenges for colleges and universities, because women students come from largely the same families and have the same backgrounds as men.

Other demographic changes have shaken things up more. One set of changes involves shifts in the relative enrollment of "traditional" and "nontraditional" students. As recently as 1970, just over a quarter (28 percent) of postsecondary students were older than twenty-four. That share had risen to 42 percent by 1990 and has been largely stable for the past twenty years.⁸ This shift

is no doubt explained at least in part by the greater availability of federal grant and loan funds that help adults manage the costs of college attendance. (These changes in funding are discussed later in this article and in the article in this issue on student aid by Susan Dynarski and Judith Scott-Clayton.⁹) Part-time enrollment, often also considered nontraditional, has grown as well. The share of students enrolled part-time rose from about one-third (32 percent) in 1970 to 43 percent by 1990, and then it too stabilized; in 2009, 38 percent of all enrollees were part-time.¹⁰

The growing share of nontraditional and low-income students in the college population has brought many changes in higher education, including declines in the average level of academic preparation of students and in their ability to finance postsecondary education without generous assistance from federal, state, and local governments, as well as from institutions themselves. Perhaps no demographic shift has been as visible or as consequential for the colleges and for society as the movement of the college population from being largely white to having substantial representation of students of color. In 1976, non-Hispanic whites made up more than four-fifths percent of all students; by 2009, this figure had dropped to less than two-thirds.¹¹ This trend reflects the expansion of the Hispanic population as a share of all Americans. Moreover, the enrollment rate among Hispanic high school graduates fluctuated around 50 percent from the early 1970s through 2000 but has since increased to around 60 percent. The proportion of black high school graduates going to college has also risen over this time period, from about two-fifths in the mid-1970s to just under three-fifths today.¹² Other significant factors explaining this trend no doubt include some

Figure 1. Share of Students Enrolled in College Immediately after High School Completion, by Family Income



Source: Susan Aud and others, "Condition of Education 2011" (U.S. Department of Education, National Center for Education Statistics, 2011).

Note: The figure shows the share of high school completers enrolled in two- and four-year colleges in the October immediately following high school completion.

improvement in the educational opportunities available before college to persons of color and greater availability of financial aid resources to enable lower-income minority students to finance college attendance. The increasing importance of postsecondary credentials in the job market has also played a role (a point discussed later in this article).

College enrollment rates have risen gradually over time for all demographic groups, but as figure 1 shows, gaps in enrollment rates across high school graduates from families at different income levels have persisted.¹³ In 1975, there was a 29 percentage point gap in college enrollment rates between students from high-income families and those from low-income families. By 1993, that gap had grown to 35 percentage points. Progress between 1993 and 2003 brought the gap back to 29 percentage points, just where it had

been thirty-four years earlier. This persistently large differential in college-going for more and less affluent families is an indication that despite the growth of financial aid and other efforts to expand educational opportunity, the enrollment prospects of children remain highly dependent on the financial circumstances of their parents.

Children from economically disadvantaged families confront challenging conditions right from birth—in neighborhood and family circumstances, in social service provision, and in the educational opportunities available to them. These differences are large enough and influential enough to make it clear that the gaps in college enrollment and educational attainment do not result solely—or even primarily—from inability to pay for college. Even controlling for academic preparation, however, large gaps in enrollment and even

larger gaps in degree attainment persist across demographic groups.¹⁴

The increasing demands on postsecondary education are to a large extent attributable to the demands of the labor force. An increasing proportion of jobs, and particularly of jobs that pay a living wage, requires higher skill levels than most high school graduates demonstrate, as well as credentials beyond a high school diploma. Indeed, Claudia Goldin and Lawrence Katz argue convincingly that the growing payoff to higher education since 1980, an integral aspect of rising inequality in the distribution of income, can best be explained by a slowdown in the growth of the skilled labor force, which has not kept pace with growing demand.¹⁵ At least partly in response to these higher returns, the fraction of high school students beginning some form of postsecondary education has risen substantially over time. Over this time period, however, the postsecondary education sectors that have grown most rapidly are the community colleges and for-profit institutions that offer vocationally oriented programs such as technical or professional associate's degrees or occupational certificates, as well as in some cases more traditional academic programs.¹⁶

American higher education has probably not for a long time, if ever, been as thoroughly traditional as “Joe College” mythology supposes, and the degree of disappearance of traditional students is likewise frequently exaggerated. Still, the shifts have been substantial, and they reflect the changing needs and goals of a population seeking postsecondary education and training for an economy and society that are themselves in rapid flux.

Understanding College Completion

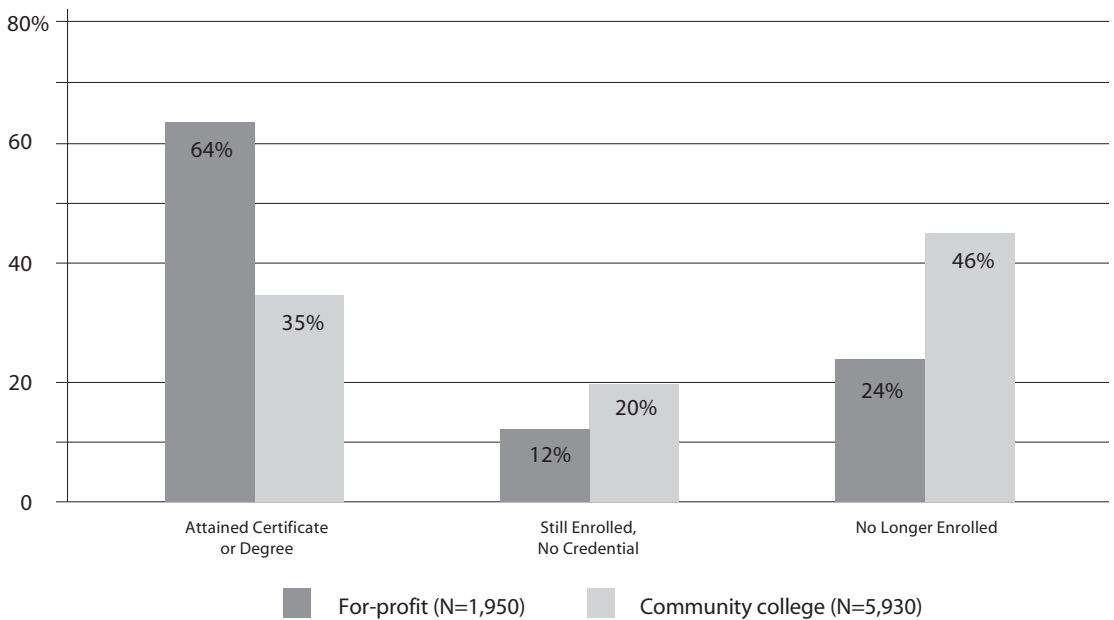
The range of credentials students pursue makes the definition of college “success”

elusive, a fact that has been particularly challenging for community colleges to manage. Even for basic success measures such as completion rates for various degree programs, available national data have limitations. A recent report from the American Council on Education that evaluates the sources of data on completions finds that no national database delivers a graduation rate accounting for all students. The report emphasizes, however, that valuable information can still be gleaned from available completions data.¹⁷

Data collected from the Beginning Postsecondary Students (BPS) study, which follows cohorts of first-time college students for six years after their initial enrollment, track those students' persistence, time to degree, and degree(s) earned. Findings from the most recent BPS cohort, which is composed of students who first enrolled in the 2003–04 academic year, indicate that about one-third of the students who began at public two-year institutions had earned a credential after six years, while nearly half had not received a credential and were no longer enrolled at any institution of higher education (figure 2). Among students beginning at four-year institutions, about two-thirds had earned credentials after six years and about one-fourth were no longer enrolled.¹⁸

Studies controlling for multiple factors influencing college graduation rates consistently show that academic preparation, as measured by test scores and high school grades, and family background—parental educational attainment and family income—are both significant determinants of college success. In addition, women are more likely to graduate than men.¹⁹ On average, students from disadvantaged minority groups enter college with weaker high school preparation and have parents with less income and fewer

Figure 2. Attainment and Persistence at Any Institution



Source: Alexandria Walton Radford and others, "Persistence and Attainment of 2003–04 Beginning Postsecondary Students: After 6 Years" (U.S. Department of Education, National Center for Education Statistics, 2010).

Notes: Estimates include students enrolled in Title IV–eligible postsecondary institutions in the fifty states, the District of Columbia, and Puerto Rico. The category "Attained Certificate or Degree" includes students who by spring 2009 had attained a certificate, associate's degree, or bachelor's degree as their highest degree. The category "Still Enrolled, No Credential" includes students who in spring 2009 were enrolled at institutions of higher learning but had not attained a degree or certificate from any institution. The category "No Longer Enrolled" includes students who in spring 2009 were not enrolled at any institution and had not attained a degree or certificate from any institution.

years of schooling than other students. These factors account for much of the difference in graduation performance between disadvantaged minority students and others. Even after adjusting for these factors, however, black men tend to have lower graduation rates than others, for reasons that are not well understood.²⁰

Meaningful comparisons of college graduation rates over time are hard to make, largely because the populations of students and schools have changed so dramatically. At any given time, students with stronger high school and test score records are more likely, other things being equal, to attend college. As a larger share of young people completes high

school and a larger share of those completers participates in postsecondary education, the academic preparation of college students who are enrolling at the margin will be lower than average. As a result, the average preparation of students entering college declines.

The issue is not that high school students are performing worse now than they did in the past; rather, it is that relatively less well-prepared high school graduates are attempting college in increasing numbers. Level of preparation is not an easy thing to measure or summarize, but scores on the National Assessment of Educational Progress (NAEP) tests—subject-matter assessments administered to nationally representative samples of

fourth-, eighth-, and twelfth-graders—provide a reasonable indicator. The format of the NAEP tests has changed very little over time, so the results offer a good long-term picture of trends in academic achievement. As it turns out, NAEP data suggest that the academic achievement of seventeen-year-olds stayed nearly constant from 1971 to 2008.²¹ In short, students are not doing more poorly in high school than they did in the past (something that older Americans love to believe); rather, students in the lower part of the high school achievement distribution are being encouraged more than ever before to acquire more education. Americans also expect or want high schools to be more effective in preparing people for college than they used to be, but this goal has so far been difficult to achieve.

A fascinating recent study by John Bound, Michael Lovenheim, and Sarah Turner sheds light on this issue.²² In a careful comparison, they found that the share of students attaining a college degree within eight years of first enrolling fell by about 5 percentage points (from 45 percent to 40 percent) between cohorts entering in 1972 and those entering in 1992. Part of the decline can indeed be explained by the entry of less-prepared students into college, but Bound and his colleagues found that a bigger factor was a reduction over time in the level of resources provided to students at the postsecondary schools that less-prepared students were more likely to attend (primarily community colleges and less selective public universities). In a similar study, the same authors looked at increases over the past thirty years in the amount of time students take to acquire bachelor's degrees. Again, they found that the phenomenon is best explained by declines in collegiate resources at public institutions outside of the most selective group of

institutions.²³ As they noted, the supply side of higher education needs to be taken into account in understanding declining graduation rates and increases in time to degree.

Barring dramatic improvements in high school achievement, it seems inevitable that, as enrollments expand, the need for developmental education (or remediation) as well as academic and personal support services in colleges increases. In 2007–08, 36 percent of first-year undergraduate students took at least one remedial course. This lack of preparation affects all postsecondary sectors, with remedial participation ranging from 26 percent among students in private nonprofit four-year institutions to 42 percent among public two-year college students during that year.²⁴ The range of support services institutions offer has also become much broader than the strictly academic coursework that the term *remediation* calls to mind. When the term first came into use, it mainly referred to the courses that older, returning students might need to familiarize themselves with content they had not been exposed to in years. Nowadays, remediation also includes courses for recent high school graduates who are judged not to have mastered basic English or math skills in high school. In addition to remedial academic coursework, many institutions are offering support services such as child care and transportation programs that aim to indirectly improve student outcomes by easing pressures in nonacademic areas of student life. In later articles in this issue, Eric Bettinger, Angela Boatman, and Bridget Terry Long discuss the many existing student support programs as well as new reforms that promise to improve student persistence and outcomes; and Andrea Venezia and Laura Jaeger discuss transitions from high school to college.²⁵

Table 1. Median Annual Earnings of Male Full-Time Wage and Salary Workers Aged 25 and Older by Educational Attainment (Constant 2011 dollars)

Year	Less than high school	High school graduate	Some college or associate's degree	Bachelor's degree or higher
1990	\$30,254	\$39,802	\$46,990	\$64,209
1995	26,445	38,622	45,434	64,370
2000	27,572	40,124	46,936	69,251
2005	27,250	39,051	45,863	69,841
2010	26,070	38,085	45,327	71,343

Source: Bureau of Labor Statistics, unpublished data.

Many of the changes discussed here have accompanied a shift away from “college” as primarily an academic pursuit for a relatively small proportion of the population to a set of diverse pursuits in postsecondary institutions valuable to a broader range of people. Many students are engaged in vocational training, not traditional academic study. These students, particularly the students who are adults with labor market experience, would have been considered job-training participants—but not college students—fifty years ago. The growth in the for-profit sector represents one aspect of this change, but community colleges also offer many programs that prepare people for specific roles in the labor market. Under this broader understanding of college as including any institution-based postsecondary education or training, the need for more people with at least some college training in the rapidly changing labor market is not difficult to understand.

The Value of a College Degree

For most of the past fifty years, job opportunities for college attendees have been relatively stronger than those for people with less education. But for a time during the 1970s,

the concept of the “overeducated American” gained credence. In a 1976 book by that title, Richard Freeman argued that the returns to a college education had declined enough to make both individuals and society as a whole question the value of sending so many people to college.²⁶ This downturn proved to be a blip, however, and by 1980, median weekly earnings of four-year college graduates were 41 percent higher than those of high school graduates. The gap has grown dramatically since then, to 65 percent in 1990, 76 percent in 2000, and 83 percent in 2010.²⁷ The difference in earnings between those with some college and those with no college has not experienced the same growth. Table 1 shows that the inflation-adjusted earnings of people with “some college or an associate’s degree” actually fell between 1990 and 2010. These figures are difficult to interpret because they include both certificate and associate degree holders, as well as those who enrolled in college but did not receive a credential. One possible explanation for the pronounced income disparity between the highest and lowest ends of the educational attainment spectrum, however, is provided by Claudia Goldin and Lawrence Katz, in their account

of how an environment of rapid technological change places a high premium on skill.²⁸

The earnings gap is often taken as a handy indicator of how much better off individuals will be if they pursue college than if they do not. But research shows that people who attend and complete college are systematically different from those who do not. Perhaps those underlying qualities are the ones that really matter, and college-goers would be more successful than others even if they skipped college. But careful statistical analyses controlling for as many individual characteristics as possible suggest that the earnings gap does provide a reliable estimate of the financial benefits of a college education.²⁹ (Evidence about rates of return in both monetary and other terms is addressed in the article by Philip Oreopoulos and Uros Petronijevic in this issue.³⁰)

The earnings gap has increased over time. Earnings of four-year college graduates outpaced inflation over the two decades from 1990 to 2010, while earnings declined for other groups. As Table 1 indicates, median earnings for full-time workers with at least a bachelor's degree increased by 8 percent from 1990 to 2000 and by another 3 percent from 2000 to 2010, after adjusting for inflation. For high school graduates, the median income grew 1 percent in the 1990s, followed by a 5 percent decline between 2000 and 2010. Back in the 1970s, Lester Thurow suggested on the basis of data like these that for many people, college education was less the road to prosperity than a "defensive necessity."³¹

Paying for College

For more than a century, the costs of supplying undergraduate enrollment have been shared among governments, families (through tuition and the forgone earnings of students),

and philanthropy. But both the mix among these funders and the mechanisms of support have shifted substantially over time.

Philanthropic support is more significant for private nonprofit education than for the other sectors, although some public research universities now have major fundraising programs. Because the philanthropic role has changed less in recent decades than has the role of governments and tuition payers, and because our focus is on public policy issues, we do not discuss it further here.

It is natural to think that families, through tuition, are paying the bulk of undergraduate education costs, especially when the fancy prices of a relative handful of elite private institutions are as influential as they are in shaping public impressions about the costs of college. These impressions are misleading. Recent trends in the "published," or "sticker," prices of various categories of institutions are the starting point for untangling this story. The published prices for postsecondary schools have been rising more rapidly than the prices of most other goods and services for many years. The average price of a year at an in-state public four-year college rose to \$8,244 in 2011–12 from \$2,242 (in 2011 dollars) thirty years earlier—an annual growth rate of 4.4 percent beyond inflation. The growth was somewhat less extreme for public two-year colleges, where the average price after adjusting for inflation rose from \$1,070 to \$2,963 (or 3.5 percent a year beyond inflation). Private nonprofit colleges saw a similar rate of increase on a much higher base price. The average price tag went from \$10,144 (in 2011 dollars) in 1981–82 to \$28,500 in 2011–12.³²

These price increases are not easy to reconcile with the dramatic increases in

enrollment, particularly the increases in participation among low-income and minority students. Key parts of the explanation are that the majority of students do not actually pay the sticker prices and that loans have increasingly become available to help them manage the prices they do pay. The wedge between the published prices and the actual prices students pay comes in the form of grant aid and, to an increasing extent, tuition tax credits. In 1981–82, grants averaged about \$2,490 (in 2011 dollars) per postsecondary student. By 2011–12, students received an average of \$6,994 apiece to help them pay for college.³³

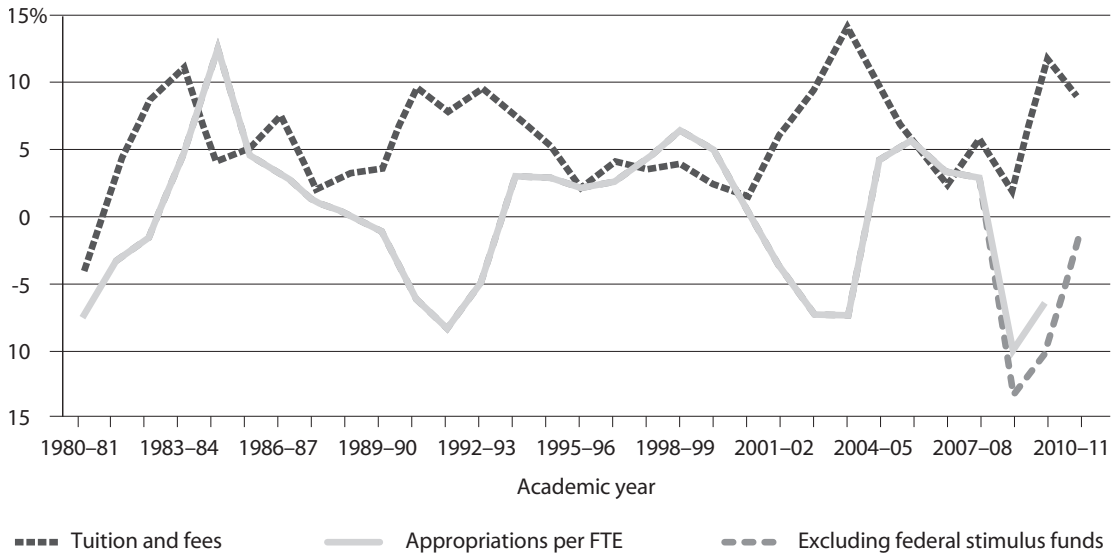
In other words, a significant portion of the increase in tuition has been covered by grant aid from federal and state governments and by grants (sometimes referred to as tuition discounts) from colleges and universities themselves. Since the start of the recent economic crisis, the federal government has been particularly instrumental in keeping the net price of college from rising rapidly along with sticker prices. Spending on the federal Pell Grant program more than doubled from \$15.9 billion (in 2011 dollars) in 2007–08 to \$34.5 billion in 2011–12.³⁴ Between 2007 and 2010, the subsidies the federal government provided to students through tax credits and deductions rose from \$7.2 billion (in 2011 dollars) to \$18.8 billion, in large part through the introduction of the American Opportunity Tax Credit.³⁵

Student aid comes primarily from the federal government and from colleges and universities themselves, but states also play a significant role. In recent years, state governments have provided approximately \$9 billion annually in student grant awards, a number that pales beside the almost \$80 billion in state appropriations to postsecondary institutions, although state student grant aid awards

have grown faster over time.³⁶ In contrast to appropriations, which lead to subsidized tuition levels enjoyed by all in-state students enrolled at an institution, state grant funds are awarded selectively, generating different net prices for different students. As recently as 1990, about 90 percent of state grants were based at least to some extent on the financial circumstances of the recipients.³⁷ Since 1993, several states, particularly in the South, have instituted “merit-based” grant programs targeted to those with high levels of academic achievement in high school, often without any consideration of financial need. Need-based state grant aid has grown slightly in recent years, increasing by \$14 per full-time equivalent undergraduate (in 2011 dollars) between 2000–01 and 2010–11, although that increase was smaller than the growth in non-need-based grants, which increased by \$52 per full-time equivalent undergraduate over the same period.³⁸

The grant aid that helps keep college prices within reach is only one element in the difference between what college education costs to produce and what families pay. Historically, the states have had the main governmental responsibility for providing access to higher education, which they have accomplished primarily by appropriating funds for public colleges and universities, covering part of the cost of institutional operations directly. This approach helps both families that cannot afford to pay the unsubsidized cost as well as more affluent families that can. With the rapid expansion in state-run higher education during the 1960s and 1970s, an expansion fueled by the economy and by the baby boom, state appropriations came to form an increasingly important source of financial support for public postsecondary institutions, constituting 44 percent of their total revenue in 1980. Since then, however, this share has

Figure 3. Annual Percentage Changes in Tuition and Fees and State Appropriations for Higher Education 1980–81 to 2010–11



Source: Sandy Baum and Jennifer Ma, “Trends in College Pricing 2011” (New York: The College Board, 2011).

Notes: Tuition and fees are adjusted for inflation; state appropriations are per full-time equivalent (FTE) student.

steadily declined, falling to 38 percent in 1990, to 32 percent in 2000, and to 22 percent in 2009.³⁹

Whether the trend has been positive or negative, state appropriations have always been cyclically sensitive, growing more slowly or shrinking when tax revenues are down. This somewhat “feast or famine” pattern of state funding for higher education wreaks havoc on long-term planning for the schools. Moreover, since the financial crash of 2007–08, famine has been the rule. The playing out of this cyclical pattern over the long term is shown in figure 3.⁴⁰ The tendency for slow growth or decreases in state appropriations and rapid increases in tuition to occur at about the same time is apparent. Less obvious is the tendency for successive peaks in appropriations to be lower.

In recent years, the challenge facing state universities has gone beyond a declining share in state support per student to an actual decline. While the patterns vary considerably across states, overall funding has failed to keep up with the rapid growth in enrollments, and state appropriations per full-time equivalent student were almost 25 percent lower in inflation-adjusted dollars in 2009–10 (\$7,100) than their level a decade earlier (\$9,300 in 2010 dollars).⁴¹ This pattern will likely be mitigated temporarily when the economy and state tax revenues recover, but there is no obvious reason to expect a reversal anytime soon in the long-run trend.

While the state role first waxed and then waned, the federal role in funding students has increased dramatically since 1960. As we noted at the outset, during the 1960s and 1970s, an era of historic growth in the

scope of many government activities from health care to foreign policy, the federal government came to embrace a continuing role in financing undergraduate higher education, intended largely to complement state efforts. Before then, federal support for higher education generally had taken the form of nonpermanent programs such as the GI Bill, which helped underwrite the college ambitions of returning veterans. The steps that gradually led to the creation of what came to be called the Pell Grant program—a program that has always had the structure, but never the legislative mandate, of an entitlement—were decisive. The Pell program established a permanent source of funding targeted at enabling college access for students from low-income families. Its introduction heralded the federal government's entrance as a key player in the higher education finance scene and signaled that it would be there to stay. Indeed, the Pell program has awarded grants to disadvantaged students for the past forty years, growing from a \$5.7 billion (in 2010 dollars) program serving 1.9 million students in 1976–77 to a \$36 billion program serving more than 9.1 million students in 2010–11.⁴²

Most federal grant aid is well targeted on low- and moderate-income students. Half of the \$36 billion in Pell Grant funding in 2010–11 went to adult students (those age twenty-four and older) with limited resources.⁴³ Two-thirds of the funds to students dependent on their parents went to those from families with incomes below \$30,000.⁴⁴ The characteristics of the students receiving this aid have changed quite dramatically, however. In 2010–11, 56 percent of Pell Grant recipients were age twenty-four or younger and 25 percent were over age thirty. In contrast, thirty years earlier, 78 percent of recipients were twenty-four or younger and only 9 percent

were over thirty.⁴⁵ This is true even though the majority of college students are still under twenty-four.⁴⁶

The federal focus on improving access to college for those with limited resources has been diminished in recent years by the addition of federal tax credits and deductions for tuition payments. These programs were designed to mitigate the burden of paying for college for middle-income families. Since the introduction of tuition tax credits in 1998, many parents and students too affluent to qualify for federal grants have received help with their college bills. Until 2009, these credits were nonrefundable and thus had no value for people without income tax liabilities. In 2009, however, 40 percent of the credit became refundable, allowing some low-income students to benefit from the tax credits. At the same time, an increase in the income cap on eligibility directed a larger percentage of the subsidy from the tax credit subsidy to taxpayers with incomes far above the median.

Although the federal government has assumed a larger role in financing postsecondary education over time, the downward trend in state funding has led to a real decline in per-student funding in higher education. Not only has this funding decline put upward pressure on public tuition, but it has also produced substantial downward pressure on production costs. To the surprise of many, the per-student expenditures on educating students at public institutions—the actual costs of supplying public higher education—have not risen much faster than general inflation in recent years. Education and related expenditures per full-time equivalent student increased at an average annual rate of about 1 percent beyond inflation at all types of public institutions from 2002 to 2008.⁴⁷ (Indeed, there is real reason to be concerned

that this downward pressure may be producing a decline in the quality of public higher education, as discussed in the article by Davis Jenkins and Olga Rodriguez in this issue.⁴⁵)

Thus, although many people draw comparisons between production cost growth in public higher education and health care, the actual situations in these industries are quite different. In health care, “bending the cost curve” refers to slowing the rate of growth in costs per patient. In public higher education, given that production costs are increasing relatively slowly, the hope is not simply to slow cost growth further, but actually to produce an education of equal quality at lower cost—bending the cost curve until it points down. Without such changes, higher education requires more and more funding as the number of students enrolled increases.

Needless to say, this analysis has not been well received by the public. Public opinion polls suggest that most Americans do not distinguish between the cost of producing education and the prices people pay (and many pollsters don’t either). Americans tend to believe that colleges are wasteful and that cost-saving innovations are easily available. In a poll conducted in 2011 by Gallup on behalf of the Lumina Foundation, 70 percent of participants reported satisfaction with the quality of higher education, whereas 25 percent reported dissatisfaction. Tellingly, however, only 24 percent reported satisfaction with its affordability, while 75 percent reported dissatisfaction. Reacting to a claim that higher tuition is correlated with higher quality, 10 percent reported strong agreement with the statement, whereas 22 percent expressed strong disagreement.⁴⁹ Figures such as these suggest a prevalent belief that the same quality of higher education should be available at lower cost. But realistically,

in the absence of major innovation in technology or otherwise, the obvious options for lowering costs quickly involve things like larger classes, less qualified instructors, or reductions in amenities like attractive living quarters and high-profile sports teams—all steps that would disappoint many of the same people who are decrying higher prices. Questions about the prospects for improving productivity therefore loom large.

Producing College Education

Before exploring the potential for improving productivity in education, we look first at the “supply side” of higher education services: who produces higher education, how is it produced, and what explains changes that have occurred in those areas? This side of higher education has received much less systematic attention from researchers than have the comparable demand-side questions about who attends college, where, and what influences their choices.

Over the past half-century, the types of institutions that produce higher education have changed quite a bit. The actual methods and technologies used in providing higher education services have also changed but less so than the population of producers. The biggest change in who produces postsecondary education has come about through the remarkable growth in community colleges, institutions that offer to most of their students two-year associate’s degrees or shorter certificate programs. Clark Kerr in 1960 called for the rapid expansion of such institutions in California, as part of the plan to put a higher education opportunity in reach of every high school graduate in the state. While two-year “junior” colleges were far from a new idea when Kerr wrote, before the community college movement hit its stride, they had been thought of largely as starter

institutions for students on their way to bachelor's degrees (or, particularly for women, as "finishing schools").

As the community college movement took hold in the 1960s, the driving force was the aim to put some postsecondary opportunity within easy geographic and financial reach of almost all students. The overwhelming emphasis was on "open access"—no or low admission standards, low tuition, and widespread geographic proximity. Thus, while community colleges were still intended to fulfill the "transfer" role of providing a gateway to four-year institutions, they were also understood to be intensely local operations that would meet the wide variety of educational needs in their particular communities. These might range from casual language instruction for people planning to travel (or simply seeking cultural enrichment) to focused vocational offerings to meet the needs of local employers. A continuing problem for community colleges, made more intense by the recent emphasis on college completion, is how to define "success" for students with such varied needs, qualifications, and interests. The growing range and variety of programming offered within a large urban or suburban community college also raises obvious challenges to managerial effectiveness and economic efficiency. To our knowledge, little systematic work has been done on these scope, efficiency, and effectiveness questions.

In quantitative terms, the magnitude of the change is easy to document. In 1963, the 740,000 students in public two-year institutions accounted for just 24 percent of public higher education enrollment; by 2009, more than 7 million students were in this sector—48 percent of all public college enrollments.⁵⁰ In recent years, some community

colleges have sought and in some measure gained the authority to grant four-year bachelor's degrees, in addition to occupational certificates and associate's degrees.⁵¹

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The community college movement predated, and perhaps to some degree stimulated, the interest of the federal government in providing funds for students to attend college. Certainly the broad geographic availability of community colleges offered parents an opportunity to envision a path for their children to college success that did not require them to leave home. Providing this option for disadvantaged students encouraged the idea that the federal government should support such students.

But if community colleges provided some of the impetus for federal grant funding of student expenses, rapid expansion of, and enrollment growth within, the private for-profit sector is almost certainly an effect of the growing availability of federally supported grants and loans. Once it became

possible for students whose families had essentially no resources to finance most of the costs of an educational program through grants and loans, a tremendous business opportunity opened up. Many for-profit suppliers rely heavily on Pell Grants and federal student loans; in an attempt to prevent institutions from relying entirely on these sources, the government since 1992 has required that these institutions get at least 10 percent of their revenues from other sources. (Funds provided to students to pay for education through the GI Bill, another significant source of funding, are not treated as federal funds for this purpose.) It seems clear that the for-profit sector could not have expanded as it has without the federal grant and loan programs. Few people in Congress at the time these programs were introduced foresaw a significant role for profit-seeking institutions, making this development a very large unintended consequence of the highly contentious decision in 1972 to provide funds to students directly as vouchers rather than through grants to institutions.⁵²

The structure of the for-profit industry has evolved as the sector has grown. The first generation of for-profit institutions, many of which were small, so-called “mom and pop” operations, suffered a major shake-up when Congress introduced rules in 1990 to deny federal funding to colleges whose students defaulted at high rates on their education loans. But after a dip in their funding share, the for-profit higher education industry has come roaring back. Today’s for-profits include several large and publicly traded firms, some with major backing from leading investment banks. Having held a negligible share of higher education enrollments in 1960, the for-profit industry accounted for 6 percent of all full-time equivalent enrollment in the fall of 2001. This share grew rapidly, and by the

fall of 2011, it had reached 12 percent.⁵³ For-profit college enrollees also receive a significant share of federal student grant aid, with 21 percent of Pell funding in 2011–12 going to students at these institutions.⁵⁴ (Further discussion of for-profit higher education can be found in the article by David Deming, Claudia Goldin, and Lawrence Katz in this issue.⁵⁵)

The Costs of Production

As we have noted, a basic challenge in sorting out who pays for “college” is the underlying fact that the costs of producing higher education have generally risen faster than costs in other industries, tending to make the price of higher education rise over time. A fundamental element explaining this phenomenon was provided in William Baumol’s and William Bowen’s diagnosis of the “cost disease.” Their theory suggests that in an economy undergoing rapid technological change, a sector that is not being transformed needs to pay workers competitively relative to those in industries where productivity is rising. The result is that relative costs rise in industries that do not tend to experience large efficiency gains from technology, and hence prices rise too.⁵⁶ This basic force surely contributes to explaining the rising long-term trend in college costs. Undergraduate education is, by and large, still produced in roughly the same labor-intensive way it was fifty or seventy-five years ago, even as faculty and other staff in colleges have received wage gains in step with workers in other industries.

That said, the cost disease alone cannot explain the entire story behind college cost changes over time. Elite private colleges and universities have been engaged for decades in a competition to reduce class sizes and increase the amenities of both academic and recreational life, a competition driven

by a desire for prestige and an increasingly demanding clientele of very affluent parents. These improvements (which may or may not increase learning productivity) put pressure on other, less affluent institutions to compete, and so add to cost pressures. At public institutions, especially the less selective ones, college expenditures are constrained by available revenues, and clear evidence shows that when revenues are constrained, whether by restrictions in government support or by weak demand in the private sector, costs rise more slowly, as do faculty and staff salaries. When those constraints ease, spending rises. (In their article in this issue, Jenkins and Rodriguez discuss production costs in more detail, focusing specifically on broad-access public institutions.)

While both the cost disease and availability of revenues offer illuminating partial explanations for the rising costs of producing higher education, other contributing factors abound: the expense of equipping institutions with the latest technology; the cost of educating students who arrive unprepared for college-level work; the cost of complying with an increasingly complex array of government regulations; the rising price of health care; and competition for students that drives improved amenities at selective institutions. Absent a sustainable solution to overcoming the cost disease and the other sources of the rising costs of producing higher education, the share of a nation's income going to pay for higher education will tend to continually rise. This is the problem that families, governments, and donors have to work out.

Differences in how undergraduate education is produced are significant across types of institutions. At large universities in both the public and private nonprofit sectors,

much instruction in freshman and sophomore classes is provided through very large lectures combined with discussion sections led by graduate students. This instructional format is used much less in smaller four-year colleges, community colleges, and for-profit institutions, partly because a labor force of graduate students is generally not available. At these latter types of institutions, introductory classes are largely taught by individual instructors in classes that are much smaller than those at big universities, which may contain many hundreds of students.

Large for-profit institutions unbundle many of the components of the instructional process, with specialists developing curricular materials and syllabi centrally, while instructors (typically local practitioners in the field of the course) conduct classes. For-profit colleges also tend to provide students with less flexible program sequences and many fewer options and pathways than do community colleges. Some scholars have argued that this highly structured approach is a good one for busy students in need of guidance and aiming to acquire specific occupational skills.⁵⁷ The emergence of for-profit higher education is plainly a major development with great potential for both innovation and abuse.

Both the public and not-for-profit sectors have experienced significant change in who delivers educational services and under what employment circumstances. A major development has been the substitution of less costly and generally less well credentialed part-time and adjunct faculty for full-time tenured and tenure-track faculty. Ronald Ehrenberg reports that the share of faculty who are full-time fell from almost 80 percent in 1970 to 51.3 percent in 2007, with "the vast majority" of part-time faculty lacking doctorates. He

further reports that among full-time faculty, the share not on tenure or tenure track grew from 18.6 percent to 37.2 percent between 1975 and 2007. Although this overall trend is explained in part by the growth of community and for-profit colleges, movements in this direction are prevalent within all sectors of postsecondary education.⁵⁸ In particular, greater reliance on lower-paid adjunct and part-time faculty helps to explain how public institutions have managed to keep the rate of growth in production cost low in the past decade, even as reductions in state funding have caused tuitions to rise rapidly.

The differences in how education is delivered across sectors and in who is delivering educational services over time seem likely to be related to differences in educational productivity and effectiveness. Do students who are taught, say, introductory psychology in large, impersonal lecture classes have a more or less valuable educational experience than those who are taught in relatively smaller classes of perhaps thirty or forty students? Does having a doctorate relate to teaching effectiveness in undergraduate courses and, if so, in what direction? Regrettably, little is known about the answers to these and similar questions. One reason is lack of agreement on exactly how to define, let alone measure, the value of an educational experience. More broadly, study of instructional effectiveness in higher education has not been a major preoccupation of the professoriate.⁵⁹

Innovation in the Production of Higher Education Services

A looming question in the study of productivity in higher education is whether novel information and communication technologies have the capacity to dramatically improve the productivity of investments in learning. More needs to be known about both

the educational value of instruction in these nontraditional modes and their costs. The urgency of finding answers to these questions arises in large part from the continuing pressure to reduce the cost of production of public higher education, as Americans seem increasingly reluctant to pay the costs either through taxes or tuition.

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A major stumbling block in judging the promise of technological innovation in improving productivity is the wide range of conceptions of what “online learning” or “computer-assisted instruction” really means. Some conceptions amount to little more than the one-way delivery of videotaped lectures—in effect, educational television delivered over the Internet. Another conception is that of conducting face-to-face classroom interactions over live Internet connections, using tools such as Skype. Others conceive of sophisticated interactive computer programs that can substitute for instructors, to a greater or lesser degree, in interactions with students. Some people think of particular courses that are easy to “digitize” while other parts of the

curriculum are delivered in more traditional ways. Others speak of putting entire degree programs online. Each of these conceptions (and there are others) is likely to have a distinctive profile in cost and educational effectiveness. There may be differential impacts on learning for different groups of students. The one thing we know for sure is that any simple generalization about online learning is almost certain to be wrong. (For further discussion, see the article in this issue by Bradford Bell and Jessica Federman on e-learning.⁶⁰)

The systematic evidence about the influence of any one of these highly varied forms of information technology on either costs or learning is meager.⁶¹ A further and, in our view, quite serious challenge to assessing the effectiveness of online education is posed by a lack of clarity about the intended outcomes of many educational programs. In many cases, the “payoff” of a particular course is measured by some “learning outcome,” which is typically a test score. It would be natural to assume that the payoff from an entire educational program is simply the sum (somehow rendered in comparable terms) of the value of the learning outcomes in every course. But whether this assumption is plausible is not at all clear, except perhaps in the case of relatively circumscribed vocational programs. It seems likely, in other words, that significant interaction effects occur across the learning in different courses in, say, an undergraduate liberal arts curriculum. More generally, “becoming educated” might be viewed as an emergent property (in the sense used in biology) of an ensemble of educational experiences. The assumption that these interactions would work out similarly if all or a large fraction of those courses were delivered in a very different way is certainly not obviously valid. Much research is needed, and external pressures suggest it had best be done soon.

Conclusion

Stepping back from the three dimensions of undergraduate education in the United States we have reviewed—the students, the financing, and the institutions—we want to return to the larger picture of how higher education has evolved and to the public policy issues about its future embedded therein.

The drive to expand America’s investment in higher education gained considerable momentum in the 1960s, and growing support from both federal and state governments was sustained into the 1980s. Then, growth in the public investment in higher education slowed, as governments reconsidered their priorities and a broader concern to curb government growth began to take hold. In the past decade, a growing worry has emerged that the national commitment to mass higher education may be unsustainable. Arguments are increasingly voiced that, particularly for students at the margin, investments in higher education no longer pay off and that college costs and prices are out of control.

Questions about both the effectiveness and the costs of America’s investments in postsecondary education certainly deserve careful examination. The proposition that high-quality education can be delivered at much lower cost through creative use of information technology warrants close study. A search for cost efficiencies in both federal and state programs that support higher education is desirable. The proposition that cost growth in higher education has made the nation’s investment in higher education unsustainable is hard to accept, however.

As we noted at the outset, in 1960, a convenient date to locate the beginning of concerted expansion in national investment in

higher education, consolidated government revenues amounted to 26 percent of GDP, and expenditures to 23 percent. The commitment to national investment in higher education accompanied other ambitious commitments to the country's infrastructure and human capacities. The interstate highway program of the 1950s, the race to the moon begun in 1961, and the creation of Medicare in 1965 are examples.

Sustaining and expanding these commitments led to an expanded role for government. From 1960 until the end of the 1990s, taxes as a share of the nation's economy gradually rose. Government spending, despite having exceeded taxes as a share of national income for much of that period, fell as a share of income through much of the 1990s, bringing the federal budget into balance at the beginning of the new millennium. Since then, taxes' share of the economy has declined while government spending has resumed its growth; both of those trends were exacerbated following the recession that began in 2007.

This story of national budget trends reflects, of course, factors much larger than those in higher education, but those trends provide a key backdrop to the public policy issues impinging on that sector. Much of the increase in government spending is driven by entitlements like Medicare and Social Security, by the fighting of wars, and by the growing burdens on states in financing medical care and other urgent needs. National revenue is heavily influenced by general pressures in both state and federal governments to force taxes down. Public spending on higher education has proven to be particularly

vulnerable because it is mostly discretionary, and, particularly at the state level, it has served as a kind of shock absorber for budgetary gaps whose sources lie elsewhere. The larger picture is that the nation seeks to sustain an expanding set of spending commitments on an ever-smaller tax base. The questions in point are not ones of whether higher education is "affordable" to the nation in some absolute sense, but rather, what sorts of public investments Americans choose to afford.

As we noted, Americans overall seem reluctant to accept the idea that they should pay more taxes to provide more education to more students. Instead the prevalent view seems to be that colleges and universities, especially those in the public sector, should simply find ways to do more with less. If nothing else, sheer political prudence requires colleges to redouble their efforts to accomplish just that, and to undertake those efforts in the most visible possible way. A great deal of evidence indicates that sustained, indeed expanded, investment in effective education at all levels is vital to the nation's future. As we reported, a substantial majority of Americans are confident about the quality of higher education, but a majority also believe it needs to be more affordable. Barring more financial support from governments, the only way to achieve more affordability without jeopardizing quality is to improve productivity. It behooves leaders in American higher education to search determinedly for productivity-improving innovations, while also striving to help the public understand the reasons why dramatic cost reduction that does not damage quality is not likely to happen overnight.

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Making College Worth It: A Review of the Returns to Higher Education

Philip Oreopoulos and Uros Petronijevic

Summary

Despite a general rise in the return to college, likely due to technological change, the cost-benefit calculus facing prospective students can make the decision to invest in and attend college dauntingly complex. Philip Oreopoulos and Uros Petronijevic review research on the varying costs and benefits of higher education and explore in full the complexity of the decision to invest in and attend college. Optimal college attainment decisions are different for all prospective students, who diverge in terms of what they are likely to get out of higher education and what specific options might be best for them. Earnings of college graduates depend in important measure on the program of study and eventual occupation they choose. Students uninterested in or unable to complete a four-year college degree appear to benefit from completing a two-year degree.

Prospective students may also face both financial constraints, which prohibit them from taking advantage of more education, and information problems and behavioral idiosyncrasies, such as reluctance to take on debt, which keep them from making optimal decisions about attending college. In their discussion of how student debt figures in the college investment, the authors note that some students borrow too little and, as a result, underinvest in their education. Carefully calculating the return on the college investment can help determine the “appropriate” amount of debt.

Students are more likely to benefit from postsecondary education the more informed they are about the expenses associated with college and the potential options for financial aid, which can be extremely complex. To make the best college investment, Oreopoulos and Petronijevic stress, prospective students must give careful consideration to selecting the institution itself, the major to follow, and the eventual occupation to pursue. For any particular program at a particular school, anticipated future labor market earnings, the likelihood of completion, the costs, and the value of any student debt must all be factored into the assessment.

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Pressure on young Americans to attend and complete college is high and rising. President Barack Obama sees college as an “economic imperative that every family in America has to be able to afford” and has set as a goal that by 2020, “America will once again have the highest proportion of college graduates in the world.”¹ A quick search of the popular press reveals many of the standard economic arguments in favor of attending college. Recent articles in the *Washington Post* and *Education Week* report that adults with a college degree have much lower unemployment rates and higher lifetime earnings than do their peers who do not attend college.² But despite the clear economic—and noneconomic—benefits that college-educated adults enjoy, the cost-benefit calculus facing prospective college students today can make the decision to invest in and attend college dauntingly complex. While policy makers and parents continue to push the nation’s youth to enter college, the cost of attending college is increasing and students are borrowing more than ever to finance the investment.³ Moreover, students today are taking longer than their peers in past decades to complete a college degree, a fact that itself can complicate the decision of whether to attend college.⁴ In this article we review research on the varying costs and benefits of higher education and explore the complexity of the decision to attend college.

We begin by explaining the classic theory that describes the decision to go to college, taking note of factors that complicate that decision. We then review evidence about the return to college and the economic benefits that college graduates enjoy, and discuss the causal effect of attending college on earnings. We emphasize that the relative returns to a college education are rising—in terms of

earnings—but are not the same for everyone who decides to attend. Earnings differ widely depending on program of study and the eventual occupation one pursues. Next we explore what is behind the recent rise in the earnings of those who attend college. Like many others, we suggest that the increase has been driven largely by technological change, which has, in turn, increased demand for workers with skills that complement the use of new technologies. We then briefly address the intensifying debate over whether college acts merely as a signal of skill that already exists at school entry or whether it fosters new skills. Next we discuss the possibility of nonpecuniary benefits stemming from college. Returning to the economic benefits of the college premium, we examine how college completion and school quality affect the premium. In closing we discuss the costs of different levels of higher education and student debt and show that the cost of college is properly considered as a long-term investment. The article concludes with a final assessment on the college investment, given the evidence we have to date.

The Decision to Attend College

According to the classic investment theory that describes the decision to attend college, individuals weigh the returns of the college investment against the costs, both direct (such as tuition) and indirect (such as forgone earnings while in college).⁵ According to the theory, if the difference between the benefits and the costs is larger than the present value of a prospective student’s lifetime earnings without attending college, the individual would attend. If everyone were to follow this simple investment model, we could deduce that for those who make the decision to attend college, the present value of the benefits exceeds the costs and that the investment is optimal.⁶

Individuals, however, may not always achieve the optimal educational investment prescribed by this model. On the simplest level, because both the costs and benefits of college can differ tremendously from one person to the next, individuals may not know ahead of time exactly what their costs and benefits will be.⁷ And recent studies have shed light on several factors that are missing from the model framework. The most obvious is the existence of credit constraints. The theory behind the model assumes that individuals can perfectly borrow against their future incomes and that they have no aversion to holding large amounts of debt. Over the past two decades, however, an increasing number of potential college students may have been pushed against their credit limits.⁸ For example, one study of cohorts from the late 1990s and early 2000s found, even after controlling for cognitive achievement, family composition, race, and residence, that youth from high-income families were still 16 percentage points more likely to attend college than youth from low-income families.⁹ Youths who are credit constrained will either underinvest in higher education, stopping their studies before it would be optimal to do so, or not invest at all. Students who take on college in the presence of credit constraints may also feel the need to combine work with their studies, thereby reducing the time, and perhaps commitment, available for schoolwork. Credit constraints seem to be a particularly plausible explanation for the increase in student average hours of work from 1993 through 2005. During this period there was a steady rise in the fraction of high school graduates combining work and school, as college prices continued to rise but sources of financial aid did not follow suit.¹⁰

Even in the absence of formal credit constraints, some individuals may be averse to

holding debt. That is, even though prospective students would be able to borrow the amount they need to finance college, they may be unwilling to do so. A 2009 study of how debt affects school enrollment and career choices analyzed an experiment conducted by the New York University School of Law to test how entering students reacted to different types of financial aid.¹¹ The university randomly offered students one of two distinct options: loans and tuition waivers. For entering students who were offered a loan, the university agreed to repay the loan if the students accepted employment in the lower-paying legal public sector upon graduation. Entering students who were offered the tuition waiver were obligated to pay the tuition at graduation if they did not accept employment in the public sector. The two aid packages were equivalent in monetary value and differed only in that the students who were offered the loan were considered to be in debt while they were enrolled in the law school. The study found that students who had their tuition waived were more likely to enroll in the law school and, once there, were significantly more likely to take a job in the public sector. Most high school students have no experience with debt, and many want to avoid incurring thousands of dollars of debt, even though they may eventually reap a significantly positive net return from the investment.

The simple model of educational investment also fails to take into account the problem of incomplete information. Before prospective students enter college, they may lack information about their ability to succeed as college students, as well as about the financial aspects of additional schooling.¹² For such students, deciding to enroll in college is a risky investment, with an uncertain payoff. Recent research in this area recognizes the existence of an “option value” associated with attending

college.¹³ Students who decide to take on an additional year of schooling are able to learn during that year about their prospects of success in college, about the costs of college, and about labor market conditions and future earnings prospects. They also gain the valuable option to act on that new information. Some students who enroll may learn that they would be better off by dropping out; some who do not enroll would have learned that they have the capacity to succeed in college. Because of the *sequential* revelation of information, the decision to invest in college should be viewed not as a one-time choice, but as a series of sequential drop-out or continue-forward decisions, each made after new information becomes available.¹⁴ Since prospective students have the freedom to respond to new information and changing circumstances, framing the college decision from this perspective makes most students better off than in the hypothetical scenario where they would be required to commit to their pre-enrollment educational choices.¹⁵

Yet another reality that is overlooked by the simple investment model is the cost of navigating through a complex financial aid program—a cost that may be so high as to deter students from attending college. A recent experimental study of financial aid programs as obstacles to college attendance divided low-income families of prospective students who visited tax preparation centers into three groups.¹⁶ In the experiment, the full-treatment group received help completing the Free Application for Federal Student Aid (FAFSA) form and was given information about financial aid eligibility and tuition prices for nearby colleges. The second group was given information on their eligibility and college tuition, and was encouraged—but only encouraged—to complete the FAFSA. The control group was simply given

a brochure with basic information about college and financial aid. The experiment found that the students who received FAFSA assistance were 25 percent more likely both to enter, and to stay in, college than those who did not.

That a small intervention can make the difference between individuals going or not going to college confirms that not all prospective students follow the straightforward investment model when making the decision whether to attend college. Compared with the potential benefits of attending college, the relatively small barrier of navigating through a complicated financial aid form would not be expected to deter college attendance if individuals were making straightforward optimal investment decisions.

This discussion illustrates that optimal decisions are different for all prospective college students. Individuals differ in terms of what they are likely to get out of higher education and what specific options might be best for them. They may face financial constraints that prohibit them from taking on debt to take advantage of more education. And, even in the absence of debt concerns, they may face information problems and behavioral idiosyncrasies may cause them not to make optimal decisions about attending college.

The College Premium, Returns, and Measurement Issues

In this section we first describe recent trends in labor market earnings for workers in different occupations and with varying levels of educational attainment. Noting that college graduates tend to earn more, on average, than those with only a high school degree across all major occupation sectors, we then turn to a discussion of the causal effect of college on earnings.

That a small intervention can make the difference between individuals going or not going to college confirms that not all prospective students follow the straightforward investment model when making the decision whether to attend college. Compared with the potential benefits of attending college, the relatively small barrier of navigating through a complicated financial aid form would not be expected to deter college attendance if individuals were making straightforward optimal investment decisions.

Descriptive Differences

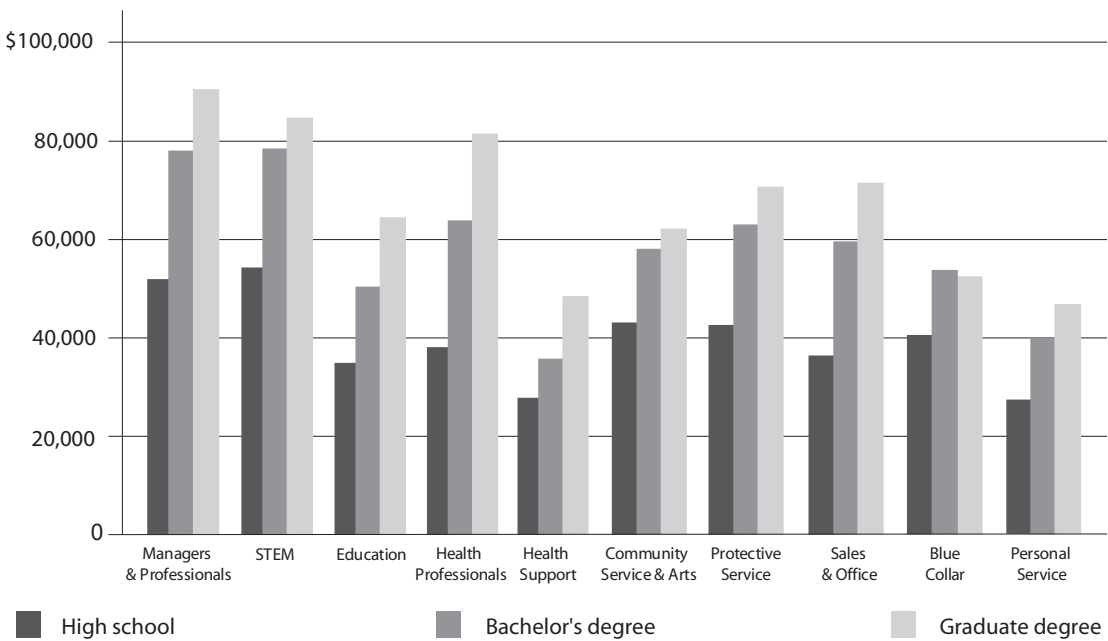
It is well-documented that college-educated adults earn more than their high-school-educated peers and that the difference has been growing over the past few decades.¹⁷ According to a study by the Georgetown University Center on Education and the Workforce, in 1999 an adult with a bachelor's degree earned 75 percent more over a lifetime than a high school graduate; by 2009 the premium had grown to 84 percent.¹⁸ Another study estimated that, on average,

a student graduating from college in 2009 would have lifetime earnings of about \$1.2 million net of tuition expenses, compared with \$780,000 for a high school graduate.¹⁹ College graduates also enjoy higher employment rates. In November of 2011 the unemployment rate for college graduates was 4.4 percent, compared with 8.5 percent for high school graduates.²⁰

Although college graduates generally earn more than those who have only high school degrees, their earnings nevertheless vary significantly across occupations. Median lifetime earnings for bachelor's degree holders are highest in the managerial, health professional, and science, technology, engineering, and mathematics (STEM) occupation sectors,²¹ and lowest in the health support, education, and personal services sectors. The median lifetime earnings in 2009 for a bachelor's degree holder working in the STEM sector, for example, were a little over \$3 million, compared with about \$1.2 million for a peer in the health support sector. But although college graduates in health support earned much less than those in the STEM sector, they earned more than those with high school degrees only.

Figure 1 displays average annual earnings by occupation and education in 2010 for full-time workers, aged thirty to fifty, from the Current Population Survey.²² As noted, average annual earnings are highest for college graduates (and for those with graduate degrees) in the managerial, STEM, and health professional sectors. Earnings for bachelor's degree holders are lowest in the health support, education, and personal service sectors. The earnings gaps between holders of bachelor's and high school degrees also differ across occupations. College graduates earned about 68 percent more on

Figure 1. Average Annual Earnings in 2010 by Occupation and Education



Source: Authors' calculations using the 2010 Current Population Survey Monthly Outgoing Rotation Groups.

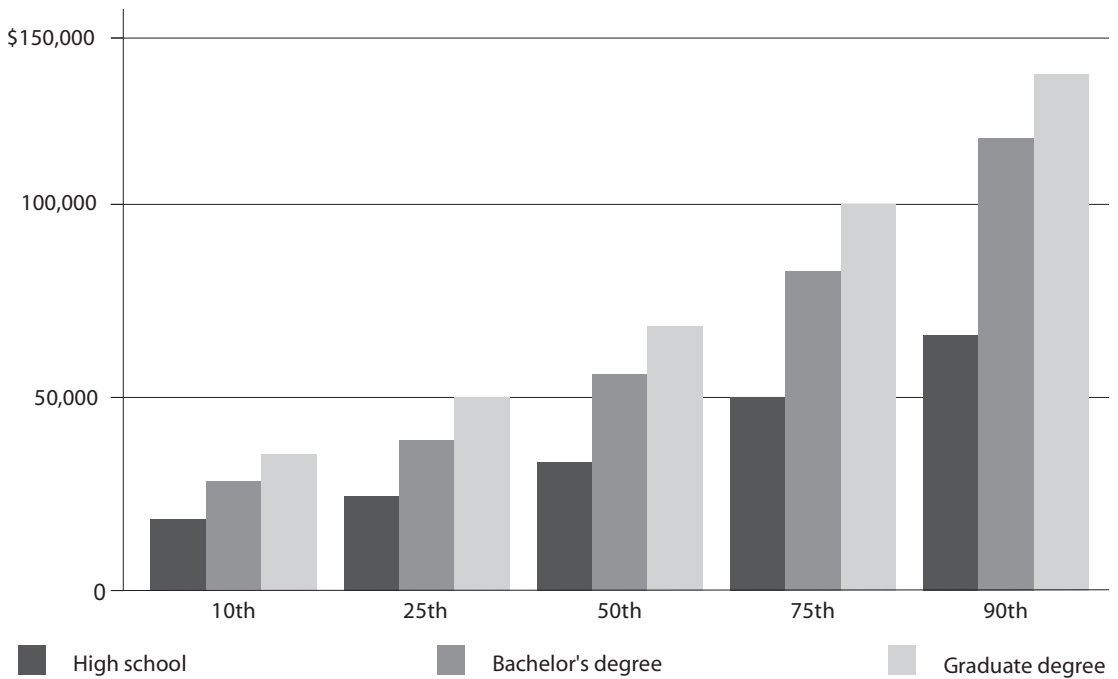
Notes: The sample is restricted to full-time workers between ages thirty and fifty. Graduate degree consists of workers with master's and doctoral degrees.

average than high school graduates in the health professional sector, compared with only 27 percent more in the health support field, making it clear that both education *and* choice of occupation are important determinants of labor market outcomes and the return to college. Without necessarily indicating direct causal relationships, occupational differences in the earnings of those with and without postsecondary education are at least worth considering for prospective students contemplating the choice of college major and eventual sector of employment.²³

Figure 2 provides a different perspective on the evidence by displaying the 10th, 25th, 50th, 75th, and 90th percentiles of the earnings distributions in 2011 for three different education levels (high school diploma, college degree, and graduate degree) among full-time

workers aged thirty to fifty. Several points are worth noting. First, in the 50th percentile the annual earnings for high school graduates are about \$34,000, compared with \$57,000 for bachelor's degree holders. That is, at the middle of the earnings distributions in 2011, bachelor's degree holders earned about 67 percent more than those with only a high school education. The earnings differences increase for individuals in the 75th and 90th percentiles across each education category—the gap in average earnings between the highest college earners and the highest high school earners is substantially more than the gap between the lowest college and high school earners. By type of degree, the figure shows that although the premium to a bachelor's degree is high, that to a graduate degree is even higher. Some studies attribute a significant part of the rise in the overall college

Figure 2. Annual Earnings Percentiles in 2011 by Education



Source: Authors' calculations using the 2010 Current Population Survey Monthly Outgoing Rotation Groups.

Notes: The sample is restricted to full-time workers between ages thirty and fifty. Graduate degree consists of workers with master's and doctoral degrees.

wage premium to the increased earnings among workers with postbachelor degrees.²⁴

In summary, a college education is associated with higher labor market earnings across all major occupation sectors. The link between college and higher earnings cannot, however, be interpreted as showing a causal effect of college attainment on earnings. The evidence presented in this section thus far should not lead readers to conclude that if any high school graduate went to college, he or she should expect to realize these labor market benefits. As we have noted, variations among individuals with respect to the costs of and benefits from college can be very large. Researchers often worry that those who stand to benefit the most from college

are the students who decide to enroll, or that workers who would earn higher wages at *any* level of schooling often tend to acquire more schooling.²⁵ These concerns lead to the well-recognized problem of self-selection. Individuals *choose* whether to attend college; therefore, if those most likely to succeed in college are the ones who usually choose to attend, then having a college education does not necessarily explain their positive outcomes. Thus, encouraging more youth to attend college will not necessarily generate similar outcomes for them.

Explaining the Premium as a Causal Effect of Attending College

To address issues of selection involved in the college premium, researchers have exploited

natural experiments—for example, circumstances or policy changes that are beyond individuals' control—that cause one group to attend college more than another group. One such natural experiment compares youths who live within commuting distance of a college with others who do not. Youths who grow up near a college face lower costs of higher education and are more likely to attend than youths who have similar characteristics but live farther away. The conditions of this natural experiment enable researchers to estimate how much college proximity affects college attendance and, in turn, how much college proximity affects eventual earnings. Thus it is possible to estimate the average gain from college attendance for those for whom college proximity makes the difference between getting a postsecondary education and not getting it. One study using this technique in 1995 found that the earnings gain for each year of additional schooling ranged from 10 to 14 percent.²⁶

Other studies have based a natural experiment on war veteran status and the GI Bill, a policy that induced some cohorts to obtain more college than others by providing financial aid and institutional support for war veterans who attended postsecondary institutions.²⁷ Using year 2000 census data, a recent study examined the returns to college based on use of the GI Bill by veterans of the Vietnam War.²⁸ This study exploited the initiation in December of 1969 of draft lotteries to determine conscription. As one would expect, being draft-eligible was highly correlated with Vietnam veteran status, but because eligibility was randomly determined, it was independent of unobserved ability factors that might influence earnings potential. Using variation in veteran status and the availability of GI Bill benefits to veterans, researchers were able to isolate

variation in schooling that is driven by random draft-eligibility and not by unobserved individual factors. The study showed that randomly drafted veterans indeed finished more years of college and that, on average, each year led to an increase in earnings of about 9 percent. A related study analyzed the Canadian version of the GI Bill, the Veterans Rehabilitation Act, and found that an extra year spent in college improved earnings for veterans by about 15 percent.²⁹

These estimates, which apply only to older cohorts affected by college proximity or draft lotteries several decades ago, are outdated. The share and types of students enrolling in college has since changed dramatically. More recent studies reflect the current population. One such study used a matching approach to estimate college returns for individuals with different predicted probabilities of completing college. Its nationally representative sample included individuals aged twenty-nine to thirty-two in 1994, thirty-three to thirty-six in 1998, and thirty-seven to forty in 2002.³⁰ The study used observable individual and family characteristics to calculate individual probabilities for completing college. It grouped individuals according to the different probabilities, so that those within each group had similar observable characteristics, on average. For each probability group, the researchers estimated the economic return to college completion. For both men and women, those who were least likely to complete college based on their observed characteristics benefited the most from completion. For example, for men with a 0–10 percent predicted probability of completing college, completion raised earnings about 30 percent; for those with a 60–100 percent predicted probability, it raised earnings only about 10 percent. This study, however, raises concern because it relies on the belief that, for those

with similar probabilities of completing college, reasons for actual attendance do not account for the differences in earnings.

A more convincing recent analysis on returns to college—specifically, for students on the margin of going to a four-year college—compares high school seniors from Florida who barely qualified to attend one of the state’s public colleges with seniors who barely missed the academic cutoff.³¹ Using data from the Florida State University System (FSUS) on seven cohorts of twelfth-grade students in high school graduating classes from 1996 through 2004, the study compares the earnings for those who barely crossed the grade threshold, and attended the university as a result, with the earnings for those who did not attend because they barely fell short of the threshold. The assumption is that those barely falling above or below the cutoff are for all practical purposes no different, on average.

The study looked at students who barely crossed the threshold at Florida International University, the school with the system’s lowest admissions standards. Students who barely fell short of the cutoff typically did not attend an FSUS school, though they may have attended a community college or four-year college with lower acceptance criteria. The results are therefore interpreted as the gain marginal students experience by attending a four-year institution relative to those who do not attend that institution, but may attend a community college. The return to these marginal students from a year at a four-year college was about 8.7 percent—nearly identical to the returns experienced by the average Florida high school graduate.³²

Other research has specifically looked at returns to two-year community colleges. A 1995 study using a sample of youths aged

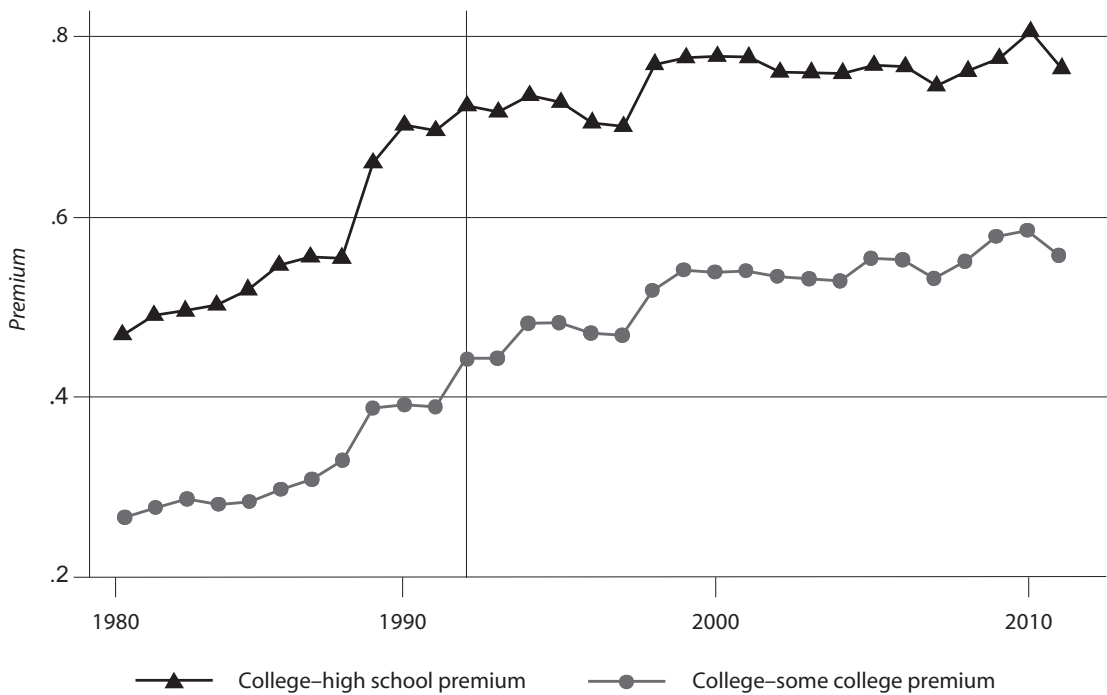
fourteen to twenty-one in 1979 found that the return for the average person to a year of community college was about 4–7 percent, compared with about 6–9 percent for a year of four-year college.³³ To provide a causal interpretation for their estimate, the researchers controlled for several variables that may be related to an individual’s family background and ability.

A more recent study used detailed administrative data from Kentucky that tracked two cohorts of students who entered the state’s community college system during the 2002–03 and the 2003–04 school years.³⁴ The researchers used changes in students’ own education attainment to estimate that, on average, the earnings of high-school-educated women rose nearly 40 percent after they earned associate’s degrees or diplomas, while men’s earnings rose approximately 18–20 percent. Another 2011 study adopting a similar before-after comparison analyzed returns to two-year colleges for young adults between the ages of twenty-four and thirty in 2008.³⁵ Students who completed an associate’s degree at a public or private college experienced an earnings gain of about 15–17 percent, or 8 percent for each year of education.

Explaining the Rise in the College Premium

In this section we seek the explanation for the remarkable rise in the college earnings premium despite an equally impressive increase in the number of students earning a college degree. Many economists have conjectured that growth in information technology over the past few decades has led to a general reorganization of the way that firms produce goods and services and a corresponding increase in demand for workers who have more abstract, multilevel, and noncognitive skills. One way to think of the

Figure 3a. The Evolution of the College Wage Premium

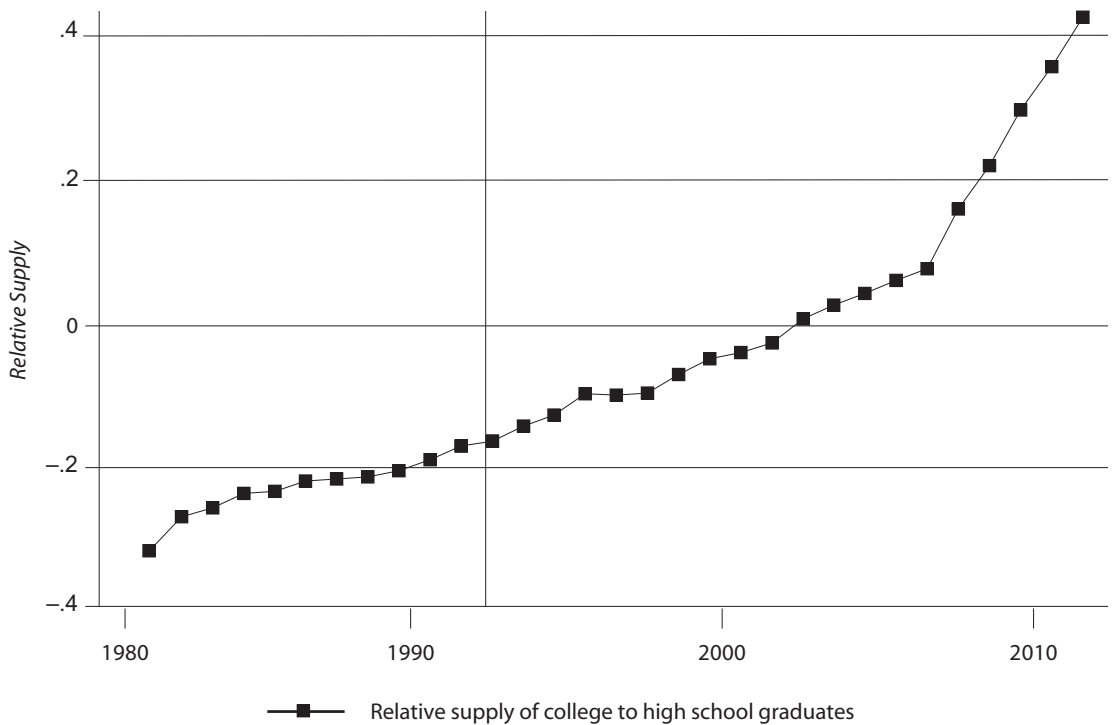


Source: Authors' calculations using the 1981–2011 Current Population Survey Monthly Outgoing Rotation Groups.

twin trends is as a race between the supply of skilled workers as proxied by educational attainment and the demand for skilled workers generated by the adoption of skill-biased technology.³⁶ Changes in technology are said to be skill-biased when they demand, or are especially complementary to, highly skilled workers.³⁷ Around 1980, demand for college-related skills started to outpace supply, and the gap has been widening ever since.³⁸ According to this argument, for the past three decades technological change has expanded demand for skilled workers, and because the supply of college-educated workers has not kept up with demand, employers have bid up the wages of college graduates, thereby raising the college earnings premium.

Figure 3 provides graphic evidence of this phenomenon for full-time workers who are thirty to fifty years old. Figure 3a shows the path of the wage premium for college graduates; figure 3b shows the path of the relative supply of college- and high school-educated workers. Relative supply is calculated as the proportion of workers who have a college degree or more, divided by the proportion who have only a high school diploma, minus one. Thus, relative supply is zero when the share of workers with a college degree is the same as the share of workers with only a high school diploma; it is positive when the share of workers with a college degree exceeds the share of workers with a high school diploma; and it is negative when the share of workers with a college degree is less than the share of workers with a high school

Figure 3b. The Evolution of the Relative Supply of College-Educated Workers



Source: Authors' calculations using the 1981–2011 Current Population Survey Monthly Outgoing Rotation Groups.

Notes: Sample consists of full-time workers between the ages of thirty and fifty. The college–high school premium is calculated as the average earnings for those with a bachelor’s degree or more divided by the average earnings of those with only a high school degree minus one. The college–some college premium is calculated as the average earnings for those with a bachelor’s degree or more divided by the average earnings of those with some college or an associate’s degree, minus one. The year 1992 marks an important change in the education category definitions. After 1992 we use highest degree attained as level of education. Before 1992, those with exactly twelve years of completed education are classified as high school, those with more than twelve but less than sixteen are classified as some college, and those with sixteen or more are classified as college. The relative supply of college grads represents the proportion of workers with a college degree divided by the proportion with only a high school diploma, minus one.

diploma. Relative supply reveals how many more college-educated workers (in percentage terms) there are than workers with only a high school diploma. The figure shows that the college-to-high-school wage premium has been steadily increasing over the past three decades, peaking in 2010 at around 81 percent, and that the relative supply of college-educated workers has been steadily increasing at the same time. In 2010 there were about 36 percent more college-educated workers than workers with only a high school

degree. The simultaneous growth of the relative supply *and* the wage premium suggests that growth in the relative demand for college-educated workers must have outpaced the growth in supply.

The past three decades have also witnessed an unusual and growing polarization in both employment and earnings. Employment opportunities and earnings have been rising both in high-education professional, technical, and managerial occupations and in

low-education food service, personal care, and protective service occupations while falling in middle-skill clerical, administrative, and sales occupations and in middle-skill production, craft, and operative occupations.³⁹ Leading explanations for these polarization patterns are the computer automation and offshoring of middle-skilled, routine tasks associated with bookkeeping, clerical work, and repetitive production, tasks once performed primarily by workers who had finished high school but not college.⁴⁰

Understanding how technological advances increase the college premium may shed light on how college is valued in the labor market. If technological change increases relative earnings for college graduates, it likely does so by increasing the relative demand for their skills. Under this theory, college graduates have superior nonroutine, abstract skills that are useful for problem solving, multitasking, and creativity. Individuals with no more than a high school diploma, however, may still benefit from an increase in demand for manual skills that cannot be automated because job opportunities that require these skills have also expanded. However, because the qualifications necessary for performing manual tasks often do not extend beyond a high school diploma, there is a large potential supply of workers who can perform these tasks. As a result, demand and wages for low-skill occupations have increased faster than for middle-skill positions, but wage growth has not been as rapid for less-educated workers as for college graduates. Figure 3a illustrates this point, showing that the average earnings of college-educated workers have grown much more than the earnings of both high school graduates and those with only some college.

Embedded in the skill-biased technological change argument is the premise that there

is an undersupply of college graduates today. Some have questioned this claim and countered that many workers with a bachelor's degree end up in jobs that do not require these credentials. In "The Undereducated American," a study conducted for the Georgetown University Center on Education and the Workforce, Anthony Carnevale and Stephen Rose explored this claim. They found that *within* occupations, individuals with a bachelor's degree almost always earn significantly more, on average, than those with only a high school diploma, even in the low-skilled occupation tier comprising labor, sales, operative, or service workers.⁴¹ It thus seems not to be the case that an oversupply of college graduates is preventing these workers from benefiting from their credentials. If employers are acting rationally, then they must be paying for some added benefits that are associated with hiring college-educated workers. As noted, these added benefits likely represent the higher analytic and technical skills that college degree holders possess.

Another argument that could account for the rise in the college premium without relying on changes in technology that favor college is that a decline in average ability among high school graduates would also raise the college premium, without college training itself affecting earnings. As noted, the past few decades have witnessed an increase in college attainment rates, which affects the composition of both college and high school graduates. In order to expand enrollment, some colleges will presumably need to lower their admissions standards, which will result in students who previously would have been denied admission gaining acceptance. Because the average academic ability of the group of new entrants is likely lower than that of those who were admitted under the more stringent standards, the overall measure of

innate ability for college students may fall. Similarly, the new entrants were likely among the higher-ability members of the high school population, so by pushing these students into college, the enrollment expansion may reduce the measure of average ability of the leftover high school graduates. A significant drop in average high school graduate productivity levels may then account for the rise in relative earnings of college graduates. A 2010 study tests this claim by attempting to measure the rise in demand for college-related skills after controlling for shifts in initial high school and college graduate ability from 1960 to 2000.⁴² The study compared individuals who were working in the same geographical region, but were born in regions with differing levels of college enrollment, to measure the extent to which workers among a larger pool of college graduates or a smaller pool of high school graduates were paid less. As noted, the intuition is that the average ability of college graduates is inversely related to the size of college enrollment, and employers will pay lower wages to less productive workers. The study concluded that the college wage premium would have been 6 percentage points *higher* in 2000, had college enrollment over the period not increased and caused a decline in the average quality of college graduates.⁴³ It can therefore likely be ruled out that cohorts of college graduates today are more able or that a drop in high school graduate ability is driving the rise in the college premium.

Signaling

An ongoing debate over the extent to which attending college improves students' skills has intensified recently with the release of *Academically Adrift: Limited Learning on College Campuses*, a book that presents extensive research showing that many undergraduate students do not actually

demonstrate improved skills while in college.⁴⁴ With study time falling and faculty feeling pressure to pass as many students as possible, some observers wonder whether attending college develops new skills or merely signals the existence of skills acquired before entering college. Determining the extent to which each is true is proving frustratingly difficult.

We note here the subtle distinction between the signaling concern and the self-selection problem described earlier. Because students self-select into college, it may be that those who choose to pursue more schooling are the most likely to benefit from college or earn higher wages at any level of schooling. Despite the empirical challenges that self-selection poses, the assumption has been that students develop new skills throughout the college experience. According to the signaling hypothesis, however, students do not actually develop new skills as they move through college, but rather use a college degree to signal their innate ability to the labor market. If there is little or no skill development throughout college, and if skill-biased technological change is driving the rise in college earnings, then pushing students into college who do not already possess substantial abstract thinking skills will not necessarily lead to the returns described above.

Recent research on signaling focuses on how quickly employers learn about true skill. One study conducted in 2010, using data from 1979 to 2004 on individuals with either a high school diploma or a college degree, found that employers recognize from the start the ability of applicants coming out of college, but not the ability of those coming from high school.⁴⁵ As a measure of ability, the authors used each individual's Armed Forces Qualification Test (AFQT) score. To

test the signaling hypothesis, they reasoned that if an employer does not fully recognize an employee's ability initially, the relationship between AFQT score (which is correlated in part with unobserved ability) and wages should grow over time. As an employer learns about a worker's ability, he will pay accordingly, and as a result, the AFQT score should become more relevant in explaining wages as the worker's experience increases. Conversely, if an employer fully and immediately observes ability, then the relationship between AFQT and wages should remain constant over time because the employer will learn nothing further about unobserved ability.

Workers in the college labor market engage in a higher level of separation as they reveal their ability through grades that appear on transcripts, the major they complete, standardized test score results, and the name of the college from which they graduate.

The study found that the AFQT score for college-educated workers was closely related with wages from the start and that the relationship remained unchanged with experience; for high-school-educated workers the AFQT score became progressively more important in explaining wages. These findings suggest that employers know fully the skills of college graduates as soon as they enter the job

market but that they need time to recognize the ability of high school graduates. That initial earnings within the pool of college graduates vary and that the variation is strongly correlated with proxies for individual ability suggest that college-educated workers are not simply separating themselves from those who have only a high school diploma. Workers in the college labor market engage in a higher level of separation as they reveal their ability through grades that appear on transcripts, the major they complete, standardized test score results, and the name of the college from which they graduate.⁴⁶

That employers seem eventually to ascertain an employee's true ability for both college and high school graduates does not necessarily imply signaling is unimportant. In particular, this test for the importance of signaling comes into question if initial job placement affects not only one's wage level but also how one's wage changes over time. An employer may realize exceptional talents in a high school graduate within a year or two after she enters the job market, but if obtaining positions that offer more training or promotion opportunities depends on the first impression (or signal) that potential employers receive, it may be too late for her to follow these other, more lucrative career tracks. For example, being at a large firm or in a particular occupation immediately after graduation may allow her to realize wage growth that would not be possible if her career had a different starting point. In this sense, while the initial signal is important only for a brief period of time, it still may have long-lasting consequences.

Some college programs teach more specific skills than others. As noted, students who graduate from computer science, engineering,

and math programs have the highest estimated average lifetime earnings. Graduates with these degrees working in their fields are likely applying skills acquired from higher education. The signaling argument might be more convincing for workers who graduate from general arts or humanities programs. For them, the link between their occupational tasks and the skills they develop in college may be less evident. It is plausible that they already possessed the productivity employers value before entering college and that they simply use college to signal these skills to the labor market. But the absence of consensus on how much students learn in different college programs leaves the important role signaling may play over the long term yet to be determined.

Nonpecuniary Benefits from College

Although our analysis thus far has stressed the pecuniary returns to college, attending college has nonpecuniary benefits as well. College life itself offers more than classroom experiences. Students enjoy spending time in the company of others of their age, participating in clubs and sports that they would not easily have access to otherwise, and satisfying their intellectual curiosity. After completing college, students may be able to anticipate other nonpecuniary benefits both inside and outside of the labor market. For example, recent evidence shows that even after controlling for different measures of family background and income, workers with more schooling hold jobs that offer a greater sense of accomplishment, more independence and opportunities for creativity, and more social interactions than jobs available to noncollege graduates.⁴⁷ Several studies have also shown that college graduates tend to enjoy better health outcomes on average.⁴⁸

The nonpecuniary benefits of attending college, like the pecuniary effects, are linked with personal characteristics such as family background. Any convincing study must isolate the effect of schooling alone. A second complication, specific to the analysis of nonpecuniary effects, is that more schooling tends to generate higher income, which itself affects certain aspects of individuals' lifestyles. Isolating the effect of schooling requires separating schooling from any effects stemming from the higher income brought about by more schooling.⁴⁹

A 2011 study used two strategies to capture the causal effects of schooling on nonpecuniary outcomes.⁵⁰ The first used rich Norwegian administrative data to compare life outcomes between siblings with different levels of schooling. That approach helped control for differences in family background and, to the extent that the reasons underlying different levels of siblings' schooling are unrelated with later socioeconomic outcomes, provides a useful estimation strategy. Even after controlling for income, the study found that siblings with an average of one more year of education married spouses with more education, were less likely to be divorced or be receiving health disability payments, and were less likely to have a teenage birth. The second strategy used a natural experiment involving changes in compulsory schooling laws across the states. Because individuals have no control over how long they are legally required to be in school, any variation in schooling caused by changes in compulsory schooling is not likely to be related to unobserved individual characteristics. This strategy too revealed positive nonpecuniary benefits: individuals with more schooling were less likely to have a teenage birth, be divorced, suffer mental ailments, or have a child be retained a grade level.

Although credibly measuring these benefits is even more difficult than measuring economic rewards from college, it is important to recognize the potential for college to affect a wide array of outcomes over one's lifetime, not just through earnings.

The Importance of College Completion and School Quality

Researchers have explored how both completing a degree and attending an institution of high quality affect the college premium. In this section we document that, despite the existence of a significant earnings boost from completing college, completion rates have stagnated among recent cohorts as students are taking longer than before to complete a degree. Upon explaining some of the hypotheses that have been advanced to explain these trends, we close the section with a discussion of the impact on earnings from attending a highly selective school.

College Completion and the College Premium

Labor economists have long documented the existence of so-called “diploma” or “sheepskin” effects, which imply that the year of schooling in which individuals complete a degree is associated with an increase in earnings above the increase observed for each previous year.⁵¹

Put differently, over and above the number of years one attends college, possessing a college degree provides an additional boost to one's earnings. Early studies on diploma effects used years of education as a measure of schooling and then inferred degree attainment when the sixteenth year of education was complete. Although such inference may suffer from measurement error, the diploma effects for bachelor's degree recipients were on the order of 25 to 28 percent.⁵² A 1995

study resolved much of the concern over measurement error by using accrued credit hours at a postsecondary institution as a measure of the quantity of education and adding separate measures for degree receipt. The estimates of bachelor's degree effects persisted, as the effects on annual earnings were estimated to be around 32.4 percent for men and 47.6 percent for women.⁵³

Given the real costs associated with not completing college or prolonging time to completion, it seems puzzling that completion rates among recent cohorts have stagnated and that time to completion has risen. Researchers have advanced several hypotheses to explain this paradox.

First, it can be argued that if individuals are behaving optimally, some students *should* drop out of college. College can be thought of as an “experience good,” the benefits of which are difficult to predict in advance.⁵⁴ Potential students differ in their ability to succeed in college and translate a college education into labor market earnings, and their individual-specific ability is not fully known before they enroll.⁵⁵ By attempting college, students can learn about their true ability and then act on this newly acquired information, deciding either to complete the program or to drop out. As noted, when the likelihood of success in college is initially uncertain, there is an “option value” to attending: receiving new information about true ability is certainly valuable, but it can only be obtained after enrollment. A 2009 study used unique survey data to explore the extent to which learning about true ability affects the decision to drop out of college.⁵⁶ The study found that at the time of entry, students tended to discount the possibility that they would perform poorly. After starting college, however, they updated their thinking to reflect their new insights

based on their experience in college, and the updating played an important role in the drop-out decision. As long as the time spent in college before dropping out is relatively short, one could argue that the benefit of acquiring new information—and having the option to act on it—outweighs the costs associated with failing to complete.

When the likelihood of success in college is initially uncertain, there is an “option value” to attending: receiving new information about true ability is certainly valuable, but it can only be obtained after enrollment.

To put the recent college completion trends into perspective, between 1970 and 1999 the college enrollment rates of students aged twenty-three who were pursuing a bachelor's degree rose substantially, but completion rates fell by 25 percent.⁵⁷ The completion rates of older groups, however, remained relatively stable, which suggests that the time it took individuals in this group to complete increased. We have already mentioned one possible explanation for these trends—financial constraints. Individuals who are unable to borrow or who have limited access to credit may be forced to work while in college, thereby extending the time required to finish a degree. Likewise, students may exhaust financial aid too quickly and be forced to put college on hold while they work and accrue more funds.⁵⁸

Another hypothesis suggests that perhaps a decline in institution quality or a reduction in resources per student at public colleges and universities is to blame for the decline in completion rates. For example, a 2010 study that used data on the 1972 and 1992 high school classes reported that time to completion has increased most among students who start college at less-selective public universities and community colleges.⁵⁹ The idea is that students are taking longer to complete their studies not because of changes in their own preparedness or demographic characteristics, but rather because public colleges and universities are providing fewer resources per student. A 2007 study suggests that public colleges and universities do not fully offset increases in student demand for higher education with increases in resources.⁶⁰ Increased enrollment that is not accompanied by additional resources leads to increased time to completion through crowding and course enrollment constraints. Students in a particularly large cohort at a given institution may find it difficult to accumulate the required number and distribution of credits in an appropriate time frame. That increased time to completion seems to be concentrated at the least-selective institutions led another study to hypothesize that one way the top-tier schools avoid reductions in resources per student is by regulating enrollment size.⁶¹

School Quality and the College Premium Research has investigated the extent to which attending a highly selective institution increases the college premium. The empirical challenge in answering this question is that students who attend top institutions may realize higher earnings regardless of where they attend school. To address the challenge, a 2002 study matched students who applied to, and were accepted by, similar colleges of

varying quality.⁶² When the study analyzed the earnings differences between students who attended more selective institutions and those who were accepted by equally selective institutions but chose to attend less selective schools, it found no broad discernible earnings effect from attending a highly selective institution. The only significantly positive effects were concentrated among a subgroup of students from low-income families.

The 2002 study, however, is the exception in a large body of research that typically does find significant economic returns to school quality.⁶³ A 2009 study by Mark Hoekstra, for example, found that attending a flagship state university had large positive earnings effects for 28- to 33-year-old individuals.⁶⁴ It compared the earnings of students who attended the school after falling just above the academic admissions cutoff and students who were just below the cutoff and did not attend. Because picking students who fall just below or just above the cutoff is essentially equivalent to random sampling, there could be few systematic differences in unobservable characteristics between the two groups. The study found that attending the most selective state university causes earnings to be approximately 20 percent higher for white males. Although Hoekstra could not confirm that students who were rejected attended college elsewhere, he presented suggestive evidence that they did so. If the majority of these students did indeed attend another institution, the findings could be confidently interpreted as the effect of attending a flagship over another university.

In summary, researchers have found that both completing college and attending an institution of high quality increase the returns to attending college. A direct corollary of these findings is that state and federal

policies aimed only at increasing access to higher education may not be enough to combat earnings inequality. As college enrollment rates have risen over the past few decades, but completion has not followed suit, policy makers have thus begun to place more emphasis on college completion.

Costs, Student Debt, and the College Investment

Having reflected at length about the benefits associated with college completion, we move on to consider how cost and student debt figure in the college investment.

Costs and the College Investment

Recent statistics provided by the College Board indicate that average annual tuition and fees for public four-year colleges are approximately \$8,200 for in-state students and \$20,770 for out-of-state students.⁶⁵ For the two groups considered together, the median annual tuition was \$8,274 in 2011–12, with about 19 percent of students enrolled in institutions charging less than \$6,000, and 8.2 percent in institutions charging more than \$18,000 a year.⁶⁶ Costs at private four-year institutions average around \$28,500. At private nonprofit four-year institutions, median annual tuition in 2011–12 was \$29,242, with about 28 percent of students enrolled in institutions charging \$36,000 or more a year. Finally, students attending public two-year colleges faced average annual tuition and fees of about \$2,900.

Clearly costs vary widely across institutions, and discrepancies between public and private tuition figures are large. Costs to students also vary depending on how much financial aid each is eligible to receive. Net tuition fees are often lower than students think. One study, for example, reviews the literature and reports evidence suggesting that high school

students overestimated the tuition cost of public four-year institutions by 65 percent; their parents, by 80 percent.⁶⁷ Just as the benefits associated with college completion can be large, so can the payoff to properly researching both the costs of, and financial aid available at, each school.

The appropriate way to assess the cost of college is as an investment to be paid for over time. Just as with a housing property, the primary question is not the total price of the property, but whether the buyer can support mortgage payments over the long run with enough resources left over for other necessities.⁶⁸ Like the benefits of purchasing a house, the benefits of obtaining a college degree are spread over the long run—certainly much longer than the period a student is in school paying annual tuition fees. The basis for establishing acceptable levels of tuition fees and appropriate levels of debt financing is earnings expected after graduation.

Such an assessment would begin with the cost of tuition. An average student attending an in-state public four-year college or university in 2011 faced net tuition and fees estimated at approximately \$2,490, once grant aid and federal education tax credits and deductions were taken into account.⁶⁹ Based on that, and not accounting for books and other supplies, the average tuition cost for a student who completes college in four to five years will be between \$9,960 and \$12,450. To cover these costs, suppose a student took out a loan which he was, upon graduating, required to repay in annual increments of \$2,500 over ten years. In the case of debt financing, this repayment figure is the first piece of relevant information in evaluating the college investment. Another is the earned income expected upon graduation. Deciding whether college is a prudent

investment requires comparing the difference between the hypothetical student's expected earnings as a college graduate and as a high school graduate, with the annual repayment figure. In 2010, workers with only a high school diploma earned \$32,000 a year, on average.⁷⁰ Therefore, if our hypothetical student is likely to earn the average high school graduate income without attending college, his or her college earnings would need to be least \$34,500 a year (\$32,000 plus the annual repayment figure) to justify the college investment. That figure translates into 7.8 percent more a year more than the earnings of the average high school graduate. In 2010, bachelor's degree holders earned approximately \$56,000 a year, on average, or 75 percent more a year than high school graduates. In this specific hypothetical scenario, going to college would cover the annual repayment figure and leave \$21,500 in excess of annual high school earnings. Such an investment in college would clearly be a sound one. In fact, because the earnings premium of college continues beyond the ten-year repayment period, the investment could be considered optimal with an even lower level of expected college earnings.

The preceding exercise is a (simplified) demonstration of how to begin to assess the college investment. Of course, earnings after college are uncertain and any calculations need to be conducted using reasonable predictions of future earnings. In addition, as noted, costs vary for in- and out-of-state students, public and private institutions, and by whether a student is eligible for, or takes advantage of, financial aid. Annual tuition, and therefore repayment figures in the event of debt financing, can be higher or lower than the hypothetical example of \$2,500 used above.

Student Debt and the College Investment

Student borrowing has drawn much media attention of late, including reports of staggering figures of student debt and stories of debt-burdened students unable to make loan repayments. How does student debt affect the college investment? Do students borrow too much or too little? A 2012 study by Christopher Avery and Sarah Turner addressed these questions.⁷¹ As background, from 1989 to 2008 the total volume of federal student loans expanded sevenfold, although the average size loan per student remained fairly constant. The share of undergraduate students taking out loans increased from 19 to 35 percent over the same period. As we have shown, the college investment often comes with a high earnings payoff, and that payoff has markedly increased in the past few decades. The increasing return to college could justify an increasing willingness to borrow in order to reap the higher returns. It may actually be the case that some students borrow too *little* and do not obtain enough schooling.

When Avery and Turner analyzed total accumulated student debt six years after college enrollment from 2004 to 2009, they found that the median accumulated debt among students at public four-year institutions was \$6,000. Among those who completed a bachelor's degree, the median was \$7,500; the 90th percentile was \$32,000. Less than half of a percent of graduating students, excluding those in the for-profit sector, had more than \$100,000 of student debt. Among student borrowers who were in repayment six years after initial college enrollment, the average ratio of monthly repayment to income was about 10.5 percent.

The authors concluded that the popular media claim that levels of student borrowing are universally too high is simply not accurate. It may even be the case that some students borrow too little and that students may, as a result, underinvest in their education. We have already shown that some individuals are averse to holding debt and may avoid taking out loans, while others may avoid making use of popular federal aid programs because they are too complicated to use effectively. Ultimately, the manner in which college costs and student debt affect the value of the college investment depends on an array of factors, including individual- and institution-specific calculations involving variations in earnings by field of study and occupation, by whether students attend highly selective or less selective institutions, and by whether they finish their studies and earn a degree. All these factors must be taken into account to predict the return on the college investment and determine the “appropriate” amount of debt.

Conclusion

What factors should prospective students consider before investing in college? Most studies that examine the causal impact of college on earnings find an average college premium between 7 and 15 percent for each year of college for all college students, including marginal ones. Furthermore, the past three decades have witnessed a remarkable rise in the earnings premium, despite equally remarkable growth in the share of American workers who are college-educated.

The increase in earnings associated with college completion, however, varies considerably. It is largest, for example, for those with postbaccalaureate degrees. Earnings benefits also appear to be associated more with some college majors than with others. Since

the 1980s, technologically driven changes to the structure of the American labor market have caused middle-skilled routine tasks to decline and both higher-skilled nonroutine and lower-skilled manual tasks to increase. Correspondingly, the earnings benefits of college vary across undergraduate majors, as students graduating from programs that foster—or signal—abstract thinking skills realize the largest earnings premiums.

Students uninterested in or unable to complete a four-year college degree nevertheless appear to benefit from completing a two-year degree. Relative to only a high school diploma, there appears to be a positive earnings gain to completing community college. In light of recent technological changes, some students may benefit more from community college programs that foster nonrepetitive manual skills. Programs in this category include those that might result in occupations as emergency medical technicians or automotive repair providers. Though such workers have not seen a substantial rise in earnings, employment opportunities that require the tasks typically performed in these occupations have risen.

Students are also more likely to benefit from postsecondary education the more informed they are about the expenses associated with college and the potential options for financial aid. Financial aid programs can be extremely complex, and students often need help thinking about how to make the college decision. Assistance in getting through the application process and in better understanding options available to them may help students benefit the most from college.

Finally, all of the available evidence, we believe, suggests that before reaching a decision about college, prospective students must give careful consideration to selecting the institution itself, the major to follow, and the eventual occupation to pursue. For any *particular* program at a *particular* school, anticipated future labor market earnings, the likelihood of completion, the costs, and the value of any student debt, must all be factored into the assessment. As difficult as it is, completing such an assessment before reaching a decision is key to making the most out of college.

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71. Avery and Turner, “Student Loans” (see note 3).

Financial Aid Policy: Lessons from Research

Susan Dynarski and Judith Scott-Clayton

Summary

In the nearly fifty years since the adoption of the Higher Education Act of 1965, financial aid programs have grown in scale, expanded in scope, and multiplied in form. As a result, financial aid has become the norm among college enrollees. Aid now flows not only to traditional college students but also to part-time students, older students, and students who never graduated from high school. Today aid is available not only to low-income students but also to middle- and even high-income families, in the form of grants, subsidized loans, and tax credits. The increasing size and complexity of the nation's student aid system has generated questions about effectiveness, heightened confusion among students and parents, and raised concerns about how program rules may interact. In this article, Susan Dynarski and Judith Scott-Clayton review what is known, and just as important, what is not known, about how well various student aid programs work.

The evidence, the authors write, clearly shows that lowering costs can improve college access and completion. But this general rule is not without exception. First, they note, the complexity of program eligibility and delivery appears to moderate the impact of aid on college enrollment and persistence after enrollment. Second, for students who have already decided to enroll, grants that tie financial aid to academic achievement appear to boost college outcomes such as persistence more than do grants with no strings attached. Third, compared with grant aid, relatively little rigorous research has been conducted on the effectiveness of student loans. The paucity of evidence on student loans is particularly problematic both because they represent a large share of student aid overall and because their low cost (relative to grant aid) makes them an attractive option for policy makers.

Future research is likely to focus on several issues: the importance of program design and delivery, whether there are unanticipated interactions between programs, and to what extent program effects vary across different types of students. The results of this evidence will be critical, the authors say, as politicians look for ways to control spending.

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On November 8, 1965, President Lyndon Johnson signed into law the Higher Education Act of 1965, which firmly established the federal government as the primary provider of financial aid for college. In his remarks that day at Southwestern Texas State College, his alma mater, President Johnson said, “To thousands of young men and women, this act means the path of knowledge is open to all that have the determination to walk it. . . . It means that a high school senior anywhere in this great land of ours can apply to any college or any university in any of the 50 states and not be turned away because his family is poor.”¹

In the nearly fifty years that have passed since the Higher Education Act was adopted, college enrollment has expanded dramatically and average aid per student has grown even faster (figure 1).² Full-time-equivalent undergraduate enrollment more than doubled, from about 6.2 million in 1971–72 to 14.2 million in 2010–11, while average aid per student more than tripled, from \$3,437 to \$12,455 (in constant 2010 dollars).³ The increase in aid per student is driven primarily by the expanding reach of the federal programs, which now flow to a more diverse range of students than was anticipated when the programs were conceived. The early programs were squarely focused on “traditional” students—young, recent high school graduates enrolled in college on a full-time basis. Federal aid was also focused on students with fairly low incomes. Government aid for students was delivered primarily by the U.S. Department of Education.⁴

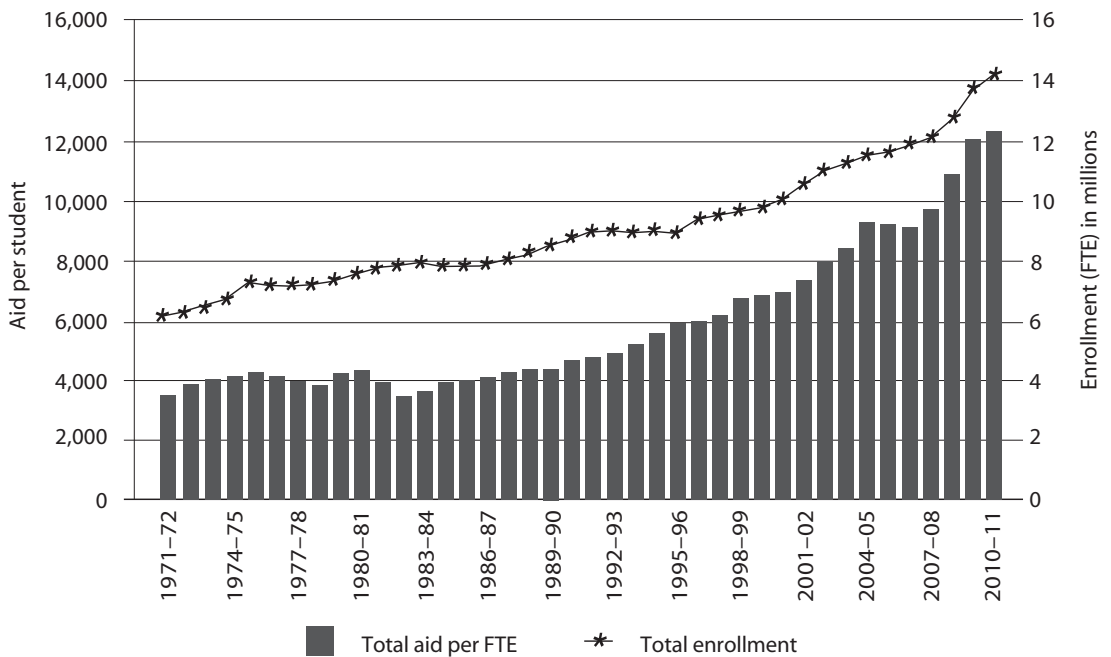
On all of these dimensions, student aid has undergone a transformation. Aid now flows not only to traditional college students, but also to part-time students, older students,

and students without a traditional high school diploma. Today, aid is available not only to low-income students but also to middle-class (and even high-income) families, in the form of subsidized loans and tax credits. And government aid is provided not only by the U.S. Department of Education but also by the U.S. Department of Treasury and by state governments. Several other forms of government support, including work-study programs, and private aid are also available. Altogether, aid to undergraduate students totaled nearly \$190 billion in the 2010–11 school year, with the majority of aid (\$147 billion) coming from government sources.

The growing magnitude of government expenditures on student aid has justified growing interest in its effectiveness. Policy makers and taxpayers want to know the returns on their enormous investment: does student aid really influence educational outcomes? Or does it simply subsidize students for doing what they would have done anyway? The increasing variety in the forms taken by aid, in the students who receive it, and in the agents who deliver it has made a simple answer to the question of aid effectiveness increasingly difficult to give.

Forty years ago, the main question asked about student aid was “Does it work?”—with “it” generally meaning Pell Grants and “work” generally referring to increases in initial college enrollment. Now, to understand the effectiveness of student aid, one needs to consider the wide array of grants, loans, and tax benefits administered by multiple agencies and levels of government. But to the extent that the form, design, and delivery of aid matter—as all evidence indicates they do—it may be difficult to extrapolate the effects of one program to another. Similarly, as college enrollments have risen, policy

Figure 1. Trends in Undergraduate Enrollment and Aid Per Student, 1971–2010



Source: College Board, *Trends in Student Aid 2011*, table 3A (1990–91 through 2010–11), and authors' calculations from table 3 (1971–72 through 1989–90).

Notes: Enrollment is measured in full-time equivalent (FTE) undergraduates. Aid is per undergraduate FTE student (including nonrecipients) and includes undergraduate grant aid from all sources, loans from all sources, federal work-study, and federal tax benefits.

makers increasingly ask not just whether aid increases initial enrollment, but also whether it increases persistence, performance, and completion, as well as whether it affects choices about where to attend, what to study, and what to do after graduation. Thus, asking whether aid “works” now depends on both the program and the outcome examined. In some cases, researchers do not have definitive answers, but can only make educated guesses about effectiveness based on related evidence from similar programs.

Moreover, students today are a much more heterogeneous group than they were forty years ago, and the effect of a given program may vary by student characteristics such as

income, age, and family status. Whether aid “works” may depend on who is receiving the aid and what outcomes they aim to achieve through postsecondary education. Coaxing an eighteen-year-old high school graduate into enrolling full-time at a four-year college is a very different task from encouraging a thirty-five-year-old displaced worker to enroll in a part-time certificate program to strengthen her job skills. The same form of federal aid—Pell Grants—funds both types of schooling for both populations, yet it may well be that Pell Grants are more effective in one case than the other. Where the evidence allows, we discuss heterogeneity in the effects of programs across groups of students who differ in age, income, or educational background, but

in most cases the available evidence focuses only on average program effects.

Finally, the explosion in the variety and reach of student aid implies that the environment in which students and families make their decisions is increasingly complex. With dozens of tax and aid programs available, two-thirds of students are now eligible for some sort of discount on their college costs.⁵ For these students, the net price of college (tuition and fees less any grant aid) differs from its sticker price. In fact, despite steadily rising tuition prices, net prices were *lower* in 2010–2011 than they were in 2005–2006.⁶ It is tuition prices, however, that make headlines, in part because they are so much easier to communicate than net price. With the proliferation of aid and tax programs, families cannot easily know in advance how much college costs. Misperceptions about the real cost may be particularly consequential for first-generation college students, whose families have no experience with the aid system. Research shows that students are often unaware of the aid for which they are eligible and that they estimate tuition costs to be two to three times higher than the true levels.⁷ If families do not know about a price subsidy, they cannot respond to it.

In this article, we describe the evolution of student aid over the past few decades, focusing on the largest programs and providing a broad overview of the rest. We then discuss whether these programs increase college enrollment, persistence, and completion (the central measures of effectiveness about which we have the most evidence), noting impacts on other outcomes where available. We first spend some time laying out the methodological challenges facing researchers in this arena, in part to explain why the evidence is sometimes so thin. We then offer

some lessons about student aid policy that we believe are supported by the existing evidence. We close with a discussion of the remaining gaps in knowledge about the effectiveness of student aid.

The Changing Landscape of Financial Aid

The major programs that subsidize college costs for undergraduates are listed in table 1, together with the totals for each program (adjusted for inflation and expressed in 2010 dollars) for selected years between 1990 and 2010. The federal loan programs and the Pell Grant were the two largest sources of aid for college throughout this period. Loans grew more rapidly than grants: loan volume was five times higher in 2010 than in 1990, while Pell volume was four times higher. Grants from colleges were the third largest source of aid; they more than tripled over this period. The education tax benefits came on the scene in the late 1990s and are now a major source of funding for college. The reasons for the particularly large increase in the federal aid programs between 2005–06 and 2010–11 are discussed in detail in the next section.

The federal programs established in Title IV of the Higher Education Act of 1965 are known collectively as “Title IV aid” and include the precursors to Pell Grants, Stafford Loans, and Federal Work-Study. Title IV aid also includes a variety of smaller programs that have waxed and waned over the years. The following discussion focuses on the largest sources of government aid shown in table 1: Pell Grants, federal loans, education tax benefits, and state grant programs.

The Pell Grant

The Higher Education Act of 1965 established the Educational Opportunity Grant Program, which allocated funds directly

Table 1. Support for Undergraduate Students by Source, 1990–91 to 2010–11 (Billions of 2010 constant dollars)

Year	1990–91	2000–01	2010–11
Federal programs			
Total federal grants	\$10.9	\$13.5	\$47.8
Pell Grants	8.3	10.0	34.8
Veterans	1.1	1.9	10.0
Other grants	1.5	1.6	3.1
Total federal loans			
Subsidized Stafford	10.3	14.4	28.4
Unsubsidized Stafford	0.0	9.7	30.3
PLUS (parent) loans	1.4	4.7	10.4
Other federal loans	2.3	1.2	0.8
Federal work-study			
Federal work-study	\$1.2	\$1.1	\$1.0
Education tax credits			
Education tax credits	0.0	4.9	18.8
State grant programs			
State grant programs	\$3.0	\$5.9	\$9.1
Grants from colleges			
Grants from colleges	8.1	15.3	29.7
Private and employer grants			
Private and employer grants	2.6	5.1	6.6
Nonfederal loans			
Nonfederal loans	0.0	4.4	6.5
Total support for undergraduate students			
Total support for undergraduate students	\$39.8	\$80.1	\$189.6
Total nonloan aid			
Total nonloan aid	\$25.7	\$45.7	\$113.1

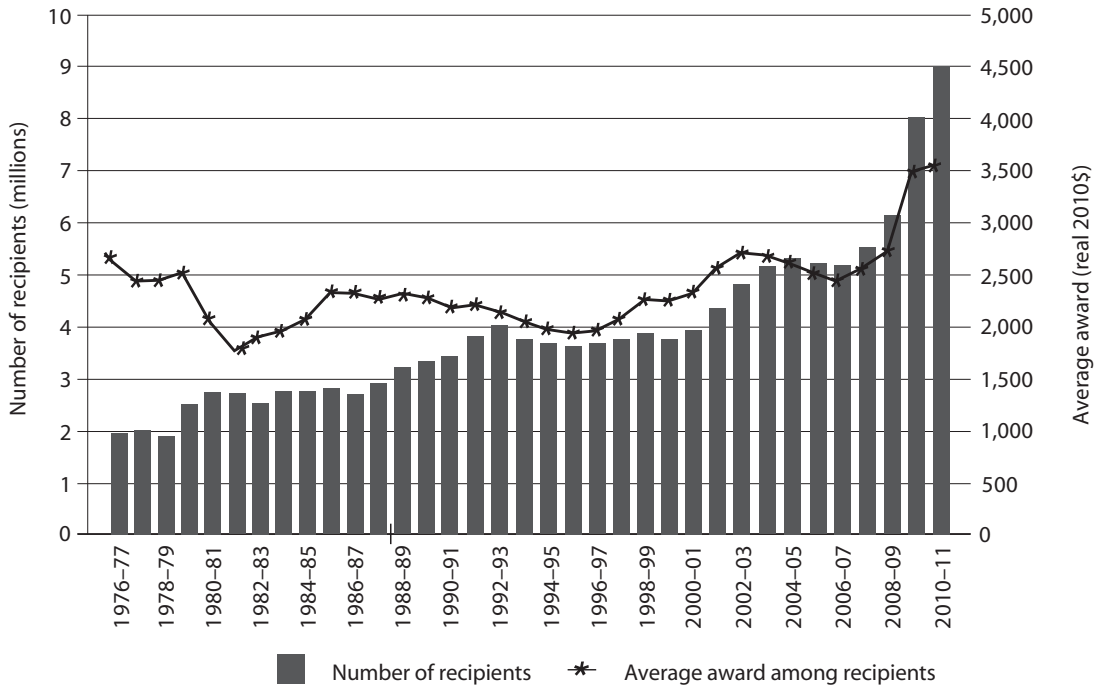
Source: Education Tax Credit data from Internal Revenue Service, *Statistics of Income* (2000, 2005, 2010), Table 3.3. All other components from College Board, *Trends in Student Aid 2011*, Table 1A.

Notes: Components may not sum to totals because of rounding. Federal loan dollars reflect disbursements beginning in 1995–96. Before then, the data reflect gross loan commitments. Figures for 2010–11 are preliminary estimates.

to colleges that committed to identifying and recruiting students with “exceptional financial need.”⁸ In 1972, the program was split into the Supplemental Educational Opportunity Grant (SEOG) program, a relatively small program that delivered funds directly to colleges, and the Basic

Educational Opportunity Grant (BEOG) program, which delivered funds directly to students. The BEOG program, renamed the Pell Grant in 1980 after Senator Claiborne Pell of Rhode Island, expanded eligibility to students attending part-time, as well as to those in vocational education or community

Figure 2. Number of Pell Recipients and Average Aid Award, 1976–77 to 2010–11



Source: College Board, *Trends in Student Aid* (2011), figure 134A, and U.S. Department of Education, *Pell End of Year Report, 2009–10* (2011).

Notes: Enrollment is measured in full-time equivalent (FTE) undergraduates. Aid is per undergraduate FTE student (including nonrecipients) and includes undergraduate grant aid from all sources, loans from all sources, federal work-study, and federal tax benefits. Aid is measured in 2010 constant dollars.

colleges. Between 1972 and 1992, college enrollments rose by 44 percent, but the number of Pell Grant recipients grew twentyfold as a result of these more generous eligibility criteria.⁹ Many of these new Pell recipients were adults returning to school: the proportion of recipients classified as independent (age twenty-four or older, married, or with children of their own) grew over this period from just 13 percent to 60 percent, where it remains today.¹⁰ As noted in the article in this issue by Sandy Baum and her colleagues, the proportion of Pell recipients who are over age thirty has tripled over the past thirty years, from 8 percent in the late 1970s to 24 percent in 2009–10.¹¹

While there is no explicit income limit on Pell receipt, the vast majority of recipients have family incomes below \$50,000, which in 2010 was slightly above the median of U.S. household incomes.¹² The definition of who is “needy” under the Pell rules has occasionally shifted, sweeping into Pell eligibility students from the middle of the income distribution. Some of these shifts resulted from explicit efforts to open the program to a wider range of incomes: the Middle Income Student Assistance Act of 1978, as its name suggests, expanded eligibility for Pell Grants to middle-income families. More subtly, changes in the maximum Pell Grant award (the usual focus of legislative debates over Title IV funding) mechanically change the

Pell phase-out range as well.¹³ That means that under the current formula, it is impossible to increase the average grant without also expanding eligibility further up the income distribution. This dynamic has been clear in recent years, when the Pell maximum rose substantially, from \$4,689 in 2008–09 to \$5,550 in 2010–11 (in constant 2010 dollars). Over the same period, during which median family incomes were dropping, the share of Pell recipients with income over \$50,000 rose from 6 percent to 9 percent.¹⁴

Figure 2 shows changes over time in the number of Pell recipients and the average Pell award among recipients. Adjusting for inflation, the average Pell Grant was flat or decreasing for most of the period between 1976–77 and 1995–96, but large increases since 2008 have raised the average Pell award to a historic high of \$3,828. Even these large recent increases, however, have barely kept pace with rising tuition prices: the “purchasing power” of the Pell actually declined slightly from 33 percent of public four-year tuition in 2008–09 to 32 percent in 2011–12.¹⁵

In 2008, legislation was passed that increased the maximum grant and expanded summer awards. These changes, combined with higher college enrollments and weak economic conditions that pushed more families into Pell eligibility, drove Pell expenditures to record levels. Pell volume increased by more than 90 percent between 2008–09 and 2010–11, with the number of recipients rising from 6.2 million to 9.1 million and the average grant among recipients increasing from \$2,945 to \$3,828.¹⁶

Federal Loans

The Stafford Loan, the largest student loan program, was named after Vermont senator and education advocate Robert T. Stafford in

1988, but it dates to 1965, when the guaranteed student loan program was introduced. In the original program, the government paid the interest on these loans during college, loans were limited to low-income students, and loan volume was only a third of grant volume. The first spike in loan volume followed enactment of the Middle Income Student Assistance Act of 1978, which opened eligibility for subsidized loans to all undergraduates, regardless of need.¹⁷ Loan volume exploded, as families seeking cheap credit—interest rates on mortgages hovered around 15 percent at the time—flooded into the student loan program. The need requirement on subsidized loans was reinstated in 1981 to contain ballooning costs.

Changes to the loan program in 1992 resulted in a sharp uptick in volume and unabated growth over the following twenty years. In 1992, an unsubsidized version of Stafford Loans was created, open to all students regardless of need. The government does not pay the interest on unsubsidized Stafford Loans while students are enrolled, but both subsidized and unsubsidized Stafford Loans offer interest rates, forbearance protections, and flexible repayment options that make them substantially more appealing than private student loans. Dependent students are allowed to borrow \$31,000 in federal loans over the course of their undergraduate career. For those deemed sufficiently needy, \$23,000 of this total can take the form of subsidized loans. A student cannot take out this full amount in a single year; there are also annual limits on borrowing (of \$2,625 to \$7,500 depending upon the student’s undergraduate standing).

Starting in 1992, parents also were allowed to borrow up to the full cost of attendance, including room and board for full-time

students, through PLUS loans, which had been established in 1980 (before 1992, these loans were capped at \$4,000). These loans are open to the parents of all college students, regardless of need. Unlike Stafford Loans, PLUS loans require a credit check. Parents are responsible for loan payments, which begin immediately. Over half of college loans initiated each year are now through the unsubsidized Stafford Loan and PLUS programs.¹⁸

Rising levels of student debt have raised fears among some commentators of a “higher education bubble” that may be exposing taxpayers to higher-than-recognized default risks, akin to the housing bubble that preceded the financial crisis of 2008.¹⁹ The aggregate volume of outstanding student loans (both federal and private) surpassed \$1 trillion in late 2011. This figure, which has received considerable press attention, nonetheless should be viewed in the context of an expanding population of current and former college students.²⁰ On a per-student basis, average loan debt at graduation has been virtually flat over the past decade.²¹ Between 2000 and 2009, the share of graduates with loans has remained stable at 65 percent, and the average cumulative debt among borrowers has held steady at around \$25,000.²² Ninety percent of students who receive bachelor’s degrees graduate with less than \$40,000 of debt, and approximately one-third borrow nothing at all.²³

Compared with other graduates, those with more than \$40,000 in undergraduate debt are 20 percentage points more likely to have attended schools costing \$20,000 or more a year (including room and board), and 20 percentage points less likely to have attended a public institution. Ten percent attended a private for-profit institution,

compared with only 1 percent of their lesser-borrowing peers. News articles tend to focus on the most extreme cases, such as graduates with \$100,000 in debt. However, only 0.1 percent of college entrants, and 0.3 percent of bachelor’s degree recipients, accumulate more than \$100,000 in undergraduate student debt.²⁴

Tax Benefits for Education

In the late 1990s, the federal government began using the tax code to subsidize college costs. The largest and most expensive of these programs were the Hope and Lifetime Learning Credits, which allowed families of college students to offset their educational costs with tax credits of up to \$1,500 a year.²⁵ These programs primarily benefited middle- and upper-income families, for several reasons. The credits were not refundable, meaning that low-income families with no tax liability would not benefit even if they otherwise qualified for the credit. Further, eligible tuition expenses were reduced by any grant aid; as a result, a student who attended the typical two-year college and was poor enough to receive the maximum Pell Grant received no tax credit. Finally, the income cutoffs for eligibility for the subsidies were set so high that less than 10 percent of filing households exceeded them.²⁶

In 2009, the Hope Credit was expanded and renamed the American Opportunity Tax Credit (AOTC).²⁷ The maximum benefit was raised to \$2,500, with \$1,000 refundable. Eligible expenses were expanded to include course-related books and supplies. Families were allowed to claim the credit for four years of undergraduate education instead of only two. The maximum benefit under the Lifetime Learning Credit was also raised, to \$2,000. Spending on the AOTC was nearly \$19 billion in 2010, compared with \$35 billion

for the Pell program.²⁸ A key disadvantage of the tax credits is that they are not delivered at the time of enrollment, but up to eighteen months later, when a family files its taxes for the relevant calendar year. This delay may limit the ability of the tax benefit to influence enrollment or persistence, because low-income individuals who most need the assistance may not be able to wait that long for the money.

Other tax breaks are available for current or former college students. Since 2002, families not claiming one of the education tax credits have been able to deduct up to \$4,000 in tuition fees from income (even if they do not itemize). Although the benefit officially expired at the end of 2011, it has been retroactively reinstated in the past and may yet be resurrected.²⁹ Additionally, up to \$2,500 in interest on student loans is deductible from taxable income, for households with incomes up to \$75,000 (single) or \$150,000 (married). The federal Coverdell Education Savings Account and state 529 programs allow annual, after-tax contributions (up to \$2,000 a year for the Coverdell; the more generous contribution limits and state tax treatment of the 529 vary by state); earnings on the accounts are untaxed if withdrawals are used for educational expenses.³⁰ The benefits of these accounts rise sharply with income, because those with the highest marginal tax rates have the most capital income to shelter from taxation.³¹ These additional deductions have little to no value for low-income families, who often take the standard deduction rather than itemize and who face relatively low marginal tax rates.

Finally, while children are generally considered independent for tax purposes after age eighteen, the age limit is extended to twenty-three if the child is enrolled in school.

This tax break allows families to save up to several thousand dollars a year for each child enrolled in college because parents can claim a dependent exemption for the student (thus reducing their taxable income) or qualify for the Earned Income Tax Credit (a refundable credit for low-income families).³²

State Grant Programs

Traditionally, states have helped to keep college affordable by subsidizing public colleges, which in turn charge lower tuition prices than they would without these subsidies. In recent years, state support for higher education has decreased and shifted from subsidizing institutions toward subsidizing students. In 2010–11, state and local appropriations per full-time-equivalent (FTE) student at public colleges averaged \$7,200, down 13 percent from \$8,300 in 1980–81 (figures in constant 2010 dollars).³³ Just in the past decade, the share of institutional revenues coming from state and local appropriations has fallen from 56 percent to 42 percent at public, four-year colleges.³⁴ One potential explanation is that states strapped by costs of prisons, Medicaid, and K-12 education see postsecondary education as the one place they can shift cost to users.³⁵

In addition to charging artificially low prices to all students, states also offer scholarships to individual students. States have more than doubled their expenditures on grant aid since 1980 (from \$285 to \$640 per FTE).³⁶ Still, the increases in state grant aid have not been large enough to make up for the decline in institutional subsidies. Most of these state grants are small-scale programs. But, beginning in the early 1990s, more than a dozen states established broad-based “merit aid” programs, the best-known of which is Georgia’s HOPE scholarship. These programs typically award full tuition and

fees at state public universities (or in some cases, an equivalent voucher to attend a private school) to residents who maintain a minimum grade point average (GPA) in high school and college. Many require a GPA of 3.0, not a particularly high threshold—in 1999, 40 percent of high school seniors met this standard.³⁷ These programs now represent more than a quarter of all state grant aid nationwide and are the primary source of state aid in several states.

How Do Students Apply for Aid?

To apply for Title IV aid, students must complete the Free Application for Federal Student Aid (FAFSA). This form, which most students now complete online, is also required for many state and institutional aid programs (some institutions also require more detailed additional information). The form requests information about students' own income and savings, their parents' income and savings, their receipt of various other types of governmental assistance, and the amounts of other income and liabilities (such as education tax credits claimed, child support paid or received, and other "money received or paid on your behalf").³⁸ This information is based upon the preceding tax year (for example, 2011 for students entering college during the 2012–13 academic year), meaning that high school students would not be able to file a FAFSA until at least January of their senior year, or after taxes are filed.

Once the FAFSA is filed, the information is processed under one of eight formulas, depending upon family income, whether a student is classified as dependent or independent, whether the student has children, whether anyone in the household received benefits from another federal means-tested program, and what type of federal income tax form the family is required to use.³⁹

The output of this process is an "expected family contribution" (EFC), which is provided to both the students and the schools to which they have applied. While integral to aid eligibility, the EFC can be difficult to interpret: it is described to students as "*not* the amount of money that your family must provide [but rather] an index that colleges use to determine how much financial aid you would receive if you were to attend their school."⁴⁰ Before 2008, the EFC was the only information on federal aid that students received upon completing the FAFSA; online applicants now also receive an estimate of their Pell eligibility.

Schools use the EFC (and potentially other information from the FAFSA or additional institutional aid application forms) to determine students' eligibility for federal, state, and institutional aid. Students must wait for schools to admit them and present them with details of their aid package. Different schools may offer the same student different amounts of aid. For example, colleges are not required to offer students the maximum Stafford Loans for which they are eligible.

Complexity, delay, and lack of transparency in the aid process mean that students and their families have little idea how much aid they will receive until after they have applied to college, which students may never do if they think they cannot afford to go. The lack of information about available aid is acute: a recent national survey of 600 Americans aged twenty-six to thirty-four found that fewer than three in ten individuals without a college degree had any idea what a FAFSA was.⁴¹ Although the U.S. Department of Education has taken steps to simplify the application process in recent years—by promoting the online application (which enables students to skip questions that do not apply to them), for

Complexity, delay, and lack of transparency in the aid process mean that students and their families have little idea how much aid they will receive until after they have applied to college, which students may never do if they think they cannot afford to go. A recent national survey of 600 Americans aged twenty-six to thirty-four found that fewer than three in ten individuals without a college degree had any idea what a FAFSA was.

example, and facilitating links with income tax data (which is required for the FAFSA but can be provided directly from the Internal Revenue Service)—the process remains daunting to many students and families.⁴²

Federal tax benefits are distributed in an entirely separate process, through the annual filing of income tax returns. Colleges provide documentation directly to the IRS of a student's enrollment and tuition payments. A disadvantage of the education tax benefits is that they are distributed only after costs are incurred; on the other hand, for many families the income tax form is easier to complete than the FAFSA.

Challenges in Evaluating the Effectiveness of Financial Aid

The theory behind student aid is straightforward: more people will buy a product (college) when its price (tuition) is lower. Price drops, demand increases: that is a lesson taught in any introductory economics course. While Econ 101 clearly predicts that financial aid should increase schooling, the magnitude of the impact is an empirical question. And because aid is offered to students on the basis of characteristics that may independently affect college enrollment and completion rates, such as income or academic performance in high school, the effect of the aid can be difficult to untangle from the effect of these other factors.

Take the example of Pell Grants, which flow primarily to students from families with income below \$50,000. Students from such families are less likely to attend college in the first place, for myriad reasons: they disproportionately attended lower-quality high schools, have weaker academic skills, and are less likely to have parents who went to college.⁴³ Those who are eligible for a Pell Grant have lower college attendance rates than those who are ineligible, but that does not imply that Pell Grants actually lower college attendance. Those who are eligible for Pell Grants are simply less likely to go to college for reasons other than their Pell eligibility.

Now take the example of state merit-based scholarships. Many states use these grants as a tool to attract high-achieving students. Students eligible for these scholarships are very likely to go to college, given their very strong academic skills. In this case, a comparison of eligible and ineligible students would overstate the effect of aid. Those who are eligible for merit scholarships are likely

to go to college for reasons other than their scholarship eligibility.

Researchers typically use statistical methods that are more sophisticated than the previous paragraphs would imply. But the same problem plagues the more technical studies: those who are eligible for aid tend to be quite different from those who are not. In theory, researchers can use statistical tools to control for any important differences between aid recipients and nonrecipients, but in practice such research is difficult. Why? First, complete data on relevant characteristics is rarely available. For example, parental wealth affects schooling decisions, both directly and through eligibility for aid, but comprehensive measures of parental (and extended family) wealth are rarely revealed in survey data, especially among adults who have completed their education. Second, and even more fundamentally, students who do receive aid may differ from those who do not on other, *unobservable* dimensions. As an example, imagine that a sample of first-year Pell Grant recipients could be matched to other first-year students at the same school, with similar age, race, gender, family income, and so on. The question would remain: if these students appear so similar in all of their other characteristics, including family income, which is the primary determinant of Pell Grant eligibility, why did some receive a grant while others did not? Several explanations for this difference may be possible, but most of them will suggest some important unobservable difference between the groups. For example, it may be that the recipients were more committed to a significant period of enrollment, compared with individuals of similar income and ability who did not apply.

The ideal solution is a randomized, controlled trial, in which aid amounts are randomly

assigned to a pool of potential college students, who are then followed for a certain period of time to compare outcomes between those receiving more and those receiving less assistance. The randomized trial is the gold standard of research methods in medicine and is increasingly used in the social sciences. Randomized trials have been used to evaluate the effect of job training programs on employment rates, the effect of smaller classes on test scores, and the effect of Head Start on children's emotional and intellectual development. The Education Sciences Reform Act of 2002 elevated the randomized trial as the preferred method for evaluation, especially for research funded by the U.S. Department of Education. Several randomized trials in financial aid are discussed later in this article.

Many policy-relevant questions about aid have yet to be addressed with a randomized trial, however. The next best approach is "quasi-experimental," in which the researcher identifies a source of naturally occurring but idiosyncratic variation in access to aid. When researchers can identify a group that has access to a program and a group that does not for reasons that are, if not explicitly random, at least unrelated to expected outcomes between the groups, then a comparison of outcomes for these two groups can yield causal estimates of aid effectiveness.

Financial aid eligibility rules have themselves proved to be a rich source of such plausibly random variation. For example, many aid programs have sharp cutoffs for eligibility, with those above specific levels of income or below certain grade point averages being ineligible. Students directly above and below these sharp breaks are likely to be very similar, but the aid that they are offered is quite different. In a regression-discontinuity analysis, researchers compare the schooling decisions

of individuals just above and just below these cutoffs and attribute any difference to the causal effect of the difference in aid eligibility. Another quasi-experimental approach exploits sharp changes in aid eligibility. When a program is introduced (or eliminated) for one group but not another, researchers can compare changes in outcomes before and after the policy change across the two groups. Susan Dynarski used this method—known as a “difference-in-difference” approach—to examine the effect of the Social Security student benefit program; we discuss this study below.⁴⁴

Lessons from the Research on Financial Aid Effectiveness

We draw four major lessons from the research on financial aid effectiveness, drawing primarily on experimental and quasi-experimental analyses. The rigor of these two approaches does not come without cost. In many cases, running an experiment or identifying a naturally occurring quasi-experiment means narrowing the analysis to a subset of treated and untreated individuals, potentially limiting the ability to generalize the results to other groups. Thus, we also place the findings from the most rigorous studies in the context of the broader nonexperimental literature, where such literature is available.

Lesson 1: Money Matters for College Access

The first lesson, grounded in more than thirty years of research, is that money matters for college access. As predicted by economic theory, when students know that they will receive a discount, enrollment rates increase. In 1988, Larry Leslie and Paul Brinkman reviewed several dozen nonexperimental studies and concluded that a \$1,000 decrease in net price was associated with a 3- to 5-percentage-point increase in college attendance.⁴⁵

Susan Dynarski examined the elimination of the Social Security Student Benefit (SSSB) program, using a difference-in-difference analysis. From 1965 to 1982, the Social Security Administration paid for millions of students to go to college. Under the SSSB program, the children of deceased, disabled, or retired Social Security beneficiaries received monthly payments while in college. At the program’s peak, 12 percent of young full-time college students were receiving these benefits. In 1981, Congress voted to eliminate the program. Except for the introduction of the Pell Grant program in the early 1970s, and the various GI Bills, elimination of this program is the largest and sharpest change in grant aid for college that has ever occurred in the United States. Dynarski found that college attendance among the affected group fell by more than a third after the grant program ended, suggesting that the availability of grant aid does in fact increase college enrollment rates above what they would be otherwise.

Several quasi-experimental studies of large state merit aid programs have also found significant positive impacts on enrollment, as did a regression-discontinuity study of the Tuition Assistance Program in the District of Columbia and two separate studies of the mid-century GI Bills. Taken together, the quasi-experimental evidence suggests that an additional \$1,000 of grant aid may increase college enrollment by 4 percentage points.⁴⁶

Grant assistance affects not only whether students attend college but also where they choose to go. For students applying to an elite East Coast institution who also applied for financial aid, an additional 10 percent in grant aid increased the probability of matriculation by 8.6 percent.⁴⁷ This estimate was obtained using a regression-discontinuity design, in

which students were ranked according to the strength of their application, and the matriculation rate of students just below discrete aid-eligibility cutoffs was compared with the rate of those just above the cutoff.

Like grant aid, federal tax benefits provide money for college that never needs to be repaid. Evidence regarding the enrollment effects of the tax benefits is limited to just two studies. An early study using a difference-in-difference approach—comparing financially eligible and ineligible families before and after the introduction of the Hope and Lifetime Learning tax credits—found no evidence that the benefits influenced likelihood of enrollment.⁴⁸ A more recent study used a similar difference-in-difference strategy, but included more recent years of data in its analysis and also took advantage of more accurate data on income eligibility.⁴⁹ This study found effects of roughly the same magnitude as has been found for grant assistance: the probability of college enrollment rose by 3 percentage points for every \$1,000 of tax-based aid. It is possible that earlier analysis simply could not discern a true effect because some families were incorrectly classified as eligible or ineligible in the data, watering down the estimated difference between groups. Or it is possible that the credits became more effective over time as awareness about them increased among eligible families.

Until recently much of the financial aid literature focused on college entry, rather than outcomes after enrollment. Several recent studies suggest that financial aid can also improve persistence and completion.⁵⁰ These studies, however, generally examine grant programs with specific academic achievement requirements for scholarship renewal. The results of these academic incentive grants do

not necessarily generalize to grant programs with no strings attached, a caveat discussed under Lesson 3.

Lesson 2: Program Complexity Undermines Aid Effectiveness

While we conclude that aid matters for college enrollment, that does not imply that all aid programs are equally effective. For example, the programs discussed above that have clearly demonstrated positive impacts on college enrollment tend to have simple, easy-to-understand eligibility rules and application procedures. The eligibility and application rules for Pell Grants—the nation’s largest grant program—are comparatively complex, requiring students to submit to the lengthy and burdensome FAFSA process for determining their eligibility.

A recent experimental study provides dramatic evidence that the complexity of the financial aid application process can itself become a significant barrier to college access.

A recent experimental study provides dramatic evidence that the complexity of the financial aid application process can itself become a significant barrier to college access.⁵¹ In the experiment, low-income families who visited a tax-preparation center were randomly assigned to one of three groups: a “full treatment” group that received both personalized information about eligibility for financial aid as well as personal assistance

with completing and submitting the FAFSA; an “information-only” group that received personalized information about financial aid eligibility but no application assistance; and a control group that received a brochure with general information about college costs, financial aid, and the value of going to college. The full treatment, which took less than ten minutes and cost less than \$100 per participant, increased immediate college entry rates by 8 percentage points (24 percent) for high school seniors and 1.5 percentage points (16 percent) among independent participants with no previous college experience. After three years, participants in the full-treatment group had accumulated significantly more time in college than the control group. They also were much more likely to have received a Pell Grant.

This experimental evidence, which demonstrates the importance of program design and delivery, may help explain why studies have found less conclusive evidence regarding the enrollment impact of Pell Grants than for aid programs with simpler eligibility and application procedures. The broadest quasi-experimental study of Pell Grants used a difference-in-difference approach to compare trends in college enrollment before and after increases in Pell Grant funding, between students who became eligible for increased funding and those who remained ineligible throughout the period. Consistent with previous nonexperimental findings, this study found no detectable effect of the introduction of Pell Grants on college enrollments for eligible (low-income) populations.⁵²

Other studies have found evidence of Pell impacts for specific subsets of the population: one study found that Pell Grants increased enrollment of older “nontraditional” students, while a study by Bettinger, described in the

next section, found suggestive evidence that the grants contributed to student persistence, at least among students who had already enrolled in college.⁵³ Both findings are consistent with a story in which information and experience with bureaucracy is important: older individuals may have learned about the Pell program over time, and continuing students may learn about the program once they enroll in school. Those who have recently graduated from high school but not yet enrolled may be the least informed and least equipped to figure out the process.

This limited evidence on the impact of Pell Grants is not definitive; the U.S. Department of Education recently initiated a randomized trial to study the effect of further expansions of the Pell Grant, which may help to resolve this uncertainty. But at a minimum, the FAFSA experiment has only heightened existing concerns that complexity and confusion surrounding the Pell eligibility and application process may be obscuring its benefits and dampening its impact among the individuals who need it most—those who are on the fence about college for financial reasons.⁵⁴

Lesson 3: Academic Incentives Appear to Augment Aid Effectiveness, Particularly after Enrollment

A third emerging lesson from the literature is that achievement incentives appear to increase effectiveness, particularly when the focus is on improving college performance and completion (as opposed to simply access). Two randomized experiments have examined the results of linking financial aid to specific GPA or credit accumulation requirements. A study by the social policy research organization MDRC examined a sample of low-income, primarily minority, female enrollees at two community colleges in Louisiana and found that performance-based scholarships

increased GPAs and persistence.⁵⁵ On the basis of these findings, MDRC initiated replication studies examining variations of this intervention in six other states; early indicators appear to reinforce the findings of the initial study.⁵⁶ An experiment at a large college in Canada found that a performance-based scholarship did in fact increase GPAs, though only for females who received academic support services in addition to the financial incentive.⁵⁷ While the lack of significant impacts for the full sample may be surprising, again there is suggestive evidence that program complexity may undermine effectiveness: a subsequent experiment with cash incentives at the same Canadian institution again found no effects overall, but did find some significant positive effects for those students receiving grades above the minimum threshold established for the incentive, with larger effects on grade outcomes for students who could correctly describe the program's rules.⁵⁸

To the extent that performance-based scholarships encourage students to devote more time and energy to their studies, an important question is whether the student may be driven purely by the relaxation of financial constraints, rather than by the performance incentives per se. A quasi-experimental study by Judith Scott-Clayton examines this question, in the context of West Virginia's PROMISE scholarship, which at the time provided free tuition and fees for up to four years to academically eligible students as long as they maintained a minimum GPA and course load in college.⁵⁹ The scholarship increased five-year graduation rates by 4 percentage points and on-time graduation rates by nearly 7 percentage points. Moreover, the achievement incentives were an important mechanism driving these increases. The scholarship increased GPAs and credits completed in the

first three years of college, but in the fourth and final year of the scholarship—while students are still receiving the money but no longer face the achievement incentives—the program's effect nearly disappeared.

In contrast, several studies of pure grants (with weak or no achievement incentives) have found less conclusive evidence of positive effects on persistence and graduation rates. Two quasi-experimental studies found suggestive but inconclusive evidence that pure grant aid improves college persistence and completion.⁶⁰ In contrast, a regression-discontinuity study of the Gates Millennium Scholarship found no evidence that the grants increased college retention or credit accumulation for its highly qualified, low-income minority participants (although it did reduce student employment and student loan debt).⁶¹

The most rigorous and broadly relevant evidence on the post-enrollment effects of grant aid comes from a randomized evaluation of the Wisconsin Scholars Grant, a privately run scholarship program that provided \$3,500 grants to Pell-eligible students already enrolled at public universities in Wisconsin. The study found no effects on persistence, grade point averages, or credit accumulation after three years for the full sample.⁶² However, for a subset of students entering college with a high risk of dropout (based on high school achievement and other background characteristics), the effects seemed to be more positive.

Academic incentives may improve not only performance after college entry but college preparation and initial enrollment as well. For example, a study of the introduction of Tennessee's state merit aid program, which provided large college scholarships to students with minimum high school GPA and

SAT/ACT test scores, found that the scholarship significantly improved high school achievement as measured by ACT test scores (the increases in test scores were too large to be explained simply by increases in retesting).⁶³ A similar study of a program in Texas that paid eleventh- and twelfth-grade students and teachers for earning passing scores on Advanced Placement (AP) exams found that the policy not only improved AP exam scores but increased college enrollment rates as well as college academic performance, even for those students who would have gone to college anyway.⁶⁴

Lesson 4: Evidence on the Effect of Loans Is Limited but Suggests Design Is Important

A fourth lesson is that even though loans are unpopular, they are a critical element in college financing, and their design might be significantly improved to minimize students' repayment risks and better communicate both risks and protections upfront. Very little rigorous research has examined how the availability of student loans affects college enrollment, performance, or completion. Susan Dynarski found suggestive, but ultimately inconclusive evidence that student loan expansions in the United States in the early 1990s led to increased college attendance.⁶⁵ Donald Heller reviewed the nonexperimental literature on whether loans increase college access and concluded that the findings "can at best be described as mixed."⁶⁶ In part, this mixed picture may reflect inconsistencies in some researchers' choice of the counterfactual: the studies may be comparing \$1 of loans with \$1 of grants, \$1 of work-study, or no aid at all. Based on the nonexperimental evidence, Heller concluded that college enrollments are not as sensitive to loans as to grants. This is unsurprising given that loans are not worth as much to students. Nonetheless, because

they also cost the government only a few cents on the dollar to provide, it remains an open question whether loans provide bigger, smaller, or the same "bang for the buck" as grant aid does.⁶⁷

More rigorous evidence from a dramatic policy change at one selective northeastern university suggests that students' career choices, if not their enrollment decisions, are influenced by levels of student debt. Jesse Rothstein and Cecilia Rouse examined the consequences of this institution's decision to replace loans in students' financial aid packages with increased institutional grant aid.⁶⁸ In two stages, the university in 1998 eliminated student loans for incoming students from low-income families and then eliminated loans for all students receiving aid in 2001. Students in cohorts that entered after the policy was fully implemented not only graduated with about \$11,000 less in debt than cohorts that entered before the policy change but also were significantly more likely to take jobs in nonprofit and public service sectors.

Debt aversion may be one important explanation for why loans do not appear to affect access as much as grants do: some students simply dislike being in debt, even when that debt enables an investment with high average returns. An experiment analyzed by Erica Field found strong evidence that students (in this case, students admitted to law school) are debt averse.⁶ Admitted students at one school were randomly assigned to receive either a public service scholarship that would convert to a loan if students did not pursue public service after graduation, or a loan that would be forgiven if students decided to pursue public service after graduation. The two treatments were financially equivalent, yet framing the program as a "loan that would be forgiven if you pursue public service" was much less

effective in inducing students to public service than a “grant that will convert to a loan if you do *not* pursue public service.” Like the FAFSA simplification study, Field’s findings provide further evidence that the details of program design and marketing can be critical.

Given the widespread reliance on student loans, a more interesting question than whether they increase college enrollment and completion at all is whether some types of loans are more effective than others. Are there ways to make loans more attractive and less risky for students, without drastically increasing costs? For example, the cost of a loan program is greatly affected by the interest rate that is charged and whether interest accrues while students are still enrolled in school. Yet evidence from other contexts indicates that individuals do not give such details as much weight as they should when making savings and borrowing decisions.⁷⁰ Similarly, with income-contingent repayment schemes, it is unclear whether students making decisions about borrowing are even aware of how their eventual payments will be calculated. If loan schemes cannot be made more comprehensible to students, any subsidies incorporated into loan programs to make them more appealing to low-income students may be ineffectual. A student’s decision to enroll and persist may be more influenced by an aid package that includes an upfront grant and an unsubsidized loan, rather than a package of equal cost to the government that includes only subsidized loans.

Conclusion

The major shifts in the financial aid landscape documented in this paper have three critical implications for aid policy. First, student aid is no longer just for poor students. Forty years ago, student aid consisted almost solely of federal grants for low-income

students. Today, colleges and states, as well as the federal government, provide grants, tax benefits, and loans to families with incomes well up the income distribution.⁷¹ In fact, the majority of students now receive financial aid of one kind or another: two-thirds of full-time college students get some form of grant aid, and many of the remainder receive federal tax credits and other forms of assistance. The aggregate amount of student aid distributed—including all forms of aid at the federal, state, and institutional level—added up to nearly \$13,000 a student in 2010–11. The volume of aid distributed and number of students affected make it more critical than ever to understand whether and how aid affects college enrollment, performance, and completion.

Second, the “sticker price” of college now diverges substantially from the net price most families face. Sticker prices have climbed steadily for decades. But net prices in all sectors were actually lower in 2009–10 than they were in 2005–06. The net price of a private four-year college declined by 2 percent between 2005 and 2009, and the net price for a public four-year college declined by 13 percent over this period. For public two-year institutions, average net prices dropped to negative \$810, meaning the average student received more in grant aid than he or she was charged in tuition and fees.⁷² The difference between sticker prices and net prices is even larger for low-income students, who qualify for the Pell Grant, which has grown increasingly generous in recent years. This divergence implies that individual students will find it harder than ever to estimate how much going to college will cost them.

Third, the increasing scope and diversity of financial aid programs implies increased

The majority of students now receive financial aid of one kind or another: two-thirds of full-time college students get some form of grant aid, and many of the remainder receive federal tax credits and other forms of assistance.

complexity—both for students trying to estimate their college costs and for policy makers trying to ensure coherence across programs. The proliferation of programs, each well-intentioned, has created a system that makes it difficult for families—especially “first-generation” families in which neither parent has attended college—to know just how affordable college can be. Calculating the net price of college for a given family requires understanding their finances as well as the rules of the Pell Grant, student loans, the tuition tax credits, state grant programs, and aid offered by individual colleges. Evidence suggests that students are quite poor at estimating net prices.⁷³ A symptom of the general confusion is that some aid goes unclaimed: the Government Accountability Office recently calculated that 14 percent of families eligible for an education tax benefit failed to claim it.⁷⁴ Forty percent of filers who used the tuition tax deduction would have been better off claiming one of the tax credits instead.

The complexity of the student aid landscape can lead to unexpected interactions between programs. For example, Susan Dynarski found that, for families on the margin of

getting more financial aid, putting money in a tax-advantaged Coverdell Savings Account led to substantial decreases in Title IV aid eligibility. In other words, the Title IV rules not only undid the tax incentive for saving but actually left a family worse off than if it had not saved at all. This collision between tax and aid policy was corrected with subsequent legislation, but there will almost certainly be more such collisions given the proliferation of aid and tax programs.

Another example of unintended interactions regards the relationship between federal aid and colleges’ own tuition pricing and financial aid decisions. Some policy makers, most notably former U.S. Secretary of Education William Bennett, have raised the concern that even if financial aid lowers prices for some students, it might enable institutions to raise tuition costs overall. Some evidence supports the so-called “Bennett Hypothesis” in the for-profit sector: Stephanie Cellini and Claudia Goldin find that proprietary schools that are eligible to receive federal Title IV aid (via eligible students who enroll) charge significantly more than similar institutions that must rely on students who can pay full price.⁷⁵ But other research finds little evidence of these effects at the public institutions attended by the majority of students.⁷⁶ More subtly, recent quasi-experimental work by Lesley Turner compared financial aid packages for students just above and below Pell Grant eligibility thresholds and found that selective nonprofit institutions claw back up to two-thirds of Pell Grant awards through reductions in institutional grant aid. However, at the public institutions most Pell recipients attend, the claw-back rate is near zero.⁷⁷

Researchers have learned an enormous amount about the effect of aid on student

behavior in recent years, as the quantity and quality of research on this topic has exploded. Aid can matter, with simple, well-designed programs producing large increases in college attendance and completion. Evidence shows that the complexity of eligibility and application procedures can undermine aid effectiveness. A recent randomized trial showed that a massive simplification of the federal aid application process produced substantial increases in college attendance, further bolstering the conclusion that design matters. It also appears that pairing grants with academic requirements can bolster the impact of financial aid on college performance and completion. Both experimental and quasi-experimental studies suggest that dollars with strings attached produce larger effects than dollars alone.

In contrast, disappointingly little evidence is available on the effects of one method that students increasingly use to pay for college: loans. Loans are likely to remain a key component of student aid packages, yet almost no evidence exists about their effects on college enrollment and completion. Finally, as both the types of aid and the types of aid

recipients continue to expand and to become more diverse, more research is likely to focus on the importance of program design and delivery, whether there are unanticipated interactions between programs, and to what extent program effects vary across different types of students.

As state and federal budgets face increasing pressures and politicians look for ways to control spending, financial aid programs will be vulnerable to cutbacks if evidence is lacking on their effectiveness, and even those programs with documented positive effects may be asked to do more with less. Fortunately, more may be known about the effects of financial aid than about any other interventions aimed at increasing postsecondary attainment. No longer is it necessary to ask the question, “Does aid work?”—for the research definitively shows that it can. But the evidence also suggests that some programs work better than others, and because of the magnitude of government investment as well as the numbers of individuals affected by student aid, the stakes have never been higher for understanding what aid programs work best and why.

Endnotes

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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

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.

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” cut-offs—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 cut-off 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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Transitions from High School to College

Andrea Venezia and Laura Jaeger

Summary

The vast majority of high school students aspire to some kind of postsecondary education, yet far too many of them enter college without the basic content knowledge, skills, or habits of mind they need to succeed. Andrea Venezia and Laura Jaeger look at the state of college readiness among high school students, the effectiveness of programs in place to help them transition to college, and efforts to improve those transitions.

Students are unprepared for postsecondary coursework for many reasons, the authors write, including differences between what high schools teach and what colleges expect, as well as large disparities between the instruction offered by high schools with high concentrations of students in poverty and that offered by high schools with more advantaged students. The authors also note the importance of noncurricular variables, such as peer influences, parental expectations, and conditions that encourage academic study.

Interventions to improve college readiness offer a variety of services, from academic preparation and information about college and financial aid, to psychosocial and behavioral supports, to the development of habits of mind including organizational skills, anticipation, persistence, and resiliency. The authors also discuss more systemic programs, such as Middle College High Schools, and review efforts to allow high school students to take college classes (known as dual enrollment). Evaluations of the effectiveness of these efforts are limited, but the authors report that studies of precollege support programs generally show small impacts, while the more systemic programs show mixed results. Dual-enrollment programs show promise, but the evaluation designs may overstate the results.

The Common Core State Standards, a voluntary set of goals and expectations in English and math adopted by most states, offer the potential to improve college and career readiness, the authors write. But that potential will be realized, they add, only if the standards are supplemented with the necessary professional development to enable educators to help all students meet academic college readiness standards, a focus on developing strong noncognitive knowledge and skills for all students, and the information and supports to help students prepare and select the most appropriate postsecondary institution.

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As Sandy Baum, Charles Kurose, and Michael McPherson discuss in their article in this issue, the postsecondary education landscape in the United States has changed dramatically over the past half-century.¹ The aspirations and actions of the vast majority of high school students have shifted, with greater percentages of students intending to complete some form of postsecondary education. For example, from 1980 to 2002, the share of tenth graders who aspired to earn at least a bachelor's degree rose from 41 percent to 80 percent, with the largest increase coming from low-income students.² Unfortunately, far too many students enter college without the basic content knowledge, skills, or habits of mind needed to perform college-level work successfully. As college-going rates increase, the limitations of the traditional and current structures, programs, and practices designed to promote student success within both secondary and postsecondary education systems and institutions become more visible.

This chapter discusses transitions from high school to college and some of the major efforts under way in states and schools to improve college preparation. It begins with an overview of the problem, including estimates of the number of high school graduates who are not ready for college and the major reasons why they are not. The chapter then explores whether current conceptions of college readiness are adequate and also what it means for students to find the right college “fit.” Next, it reviews some of the major interventions designed to improve college readiness, particularly among low-income students: the federal TRIO programs, the Early College High School (ECHS) and Middle College High School (MCHS) initiatives, dual-enrollment programs, California's

Early Assessment Program, and statewide default curricula. Finally, it describes the Common Core State Standards movement and concludes with a discussion of both the need for more comprehensive and systemic reforms and the challenges related to implementing them.

Understanding the Problem

In recent years, roughly 3 million students have been graduating from U.S. high schools annually. According to the National Center for Educational Statistics, more than 2.9 million students graduated from U.S. high schools in 2008, the last year for which data are available.³ A key question is, how many of these students are prepared for college-level work?

College readiness is commonly understood as the level of preparation a student needs to enroll and succeed in a college program (certificate, associate's degree, or baccalaureate) without requiring remediation.⁴ While there is no precise way of knowing how many high school graduates meet this standard, the largest nationally representative and continuing assessment of what America's students know and can do in various subject areas—the National Assessment of Educational Progress (NAEP)—suggests that many students are likely falling short. The NAEP determines students' achievement level—basic, proficient, or advanced—based on input from a broadly representative panel of teachers, education specialists, and members of the general public. Students determined to be proficient or advanced have demonstrated a competency over challenging subject matter that would be expected of entering college students, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter. In 2009,

only 38 percent of twelfth-grade students performed at or above the proficient level on NAEP's reading assessment; even fewer, 26 percent, were at or above the proficient level in mathematics.⁵

Other common assessments used to determine college readiness are the ACT and SAT exams, which are typically administered to high school juniors and seniors. In 2012, only 25 percent of all ACT-tested high school graduates met the College Readiness Benchmarks in all four subjects, meaning that they earned the minimum score needed to have a 50 percent chance of obtaining a "B" or higher in corresponding first-year college courses. Fifty-two percent of graduates met the ACT's reading benchmark, 46 percent met the mathematics benchmark, and 67 percent met the English benchmark. Only 31 percent met the benchmark in science.⁶ Looking at SAT data, among the high school graduating class of 2012, only 43 percent of all SAT takers met the SAT College & Career Readiness Benchmark, which indicates a 65 percent likelihood of obtaining a "B-" average or higher during the first year of college.⁷

The reasons why more high school graduates are not ready for college are complex and highly dependent upon individual circumstances. The factors are academic and non-academic; schools are able to control some of them but not others, such as family variables and peer influences outside of school. On the academic side, many studies over the past ten years have documented the disconnect between what high school teachers teach and what postsecondary instructors expect with regard to students' preparation for first-year credit-bearing courses in college.⁸ High school courses, such as algebra, often teach content such as factoring equations by using

rote memorization of algorithms, rather than engaging students in problem-solving and critical-writing exercises that develop both deeper knowledge of the content and the more general logical and analytical thinking skills valued at the postsecondary level.⁹ Most public high schools offer at least one Advance Placement (AP) or, less commonly, one International Baccalaureate (IB) course. These courses are designed to be more rigorous than a standard high school course and to foster the critical thinking skills expected of college students. That said, the College Board, which administers the AP program, reports that only 30 percent of 2011 public high school graduates participated in AP courses and only 18.1 percent succeeded in scoring 3 or higher ("qualified" to receive college credit or placement into advanced courses) on at least one AP exam.¹⁰

The decentralized nature of education in the United States—in which states delegate authority to more than 15,000 local school districts to design and direct programs of instruction—may partly explain the variation in what high schools offer and how well they prepare students for college.¹¹ In the 2010–11 academic year, more than 49 million students were enrolled in public elementary and secondary schools.¹² The key characteristics of those schools show disparities by race and ethnicity and by poverty level. For example, 60 percent of Asian/Pacific Islander and just over half of white high school freshmen attended schools in which the counselors reported that the primary goal of the school guidance program was to help students prepare for college. In contrast, only 44 percent of black freshmen, 41 percent of Hispanic freshmen, and 29 percent of American Indian/Alaskan Native freshmen attended such schools.¹³ White and Asian students are more likely to attend low-poverty schools,

while American Indian/Alaskan Native, black, and Hispanic students are more likely to attend high-poverty schools. In 2007–08, approximately 91 percent of twelfth-graders in low-poverty schools graduated with a diploma, compared with 68 percent of twelfth-graders in high-poverty schools (based on eligibility for free or reduced-price lunch).¹⁴ In that same year, 52 percent of high school graduates from low-poverty schools attended a four-year postsecondary institution, compared with about 28 percent of graduates from high-poverty schools.¹⁵ Unfortunately, current disparities could grow, given recent budget cuts to all levels of education—primary, secondary, and postsecondary—that are likely to affect low-income students the most.¹⁶

As noted, nonacademic factors also affect college readiness. Students' families play an important role in setting expectations and creating conditions—from overseeing completion of homework assignments to encouraging a variety of learning opportunities outside of school—that make it more or less likely that students will be prepared for college. Not surprisingly, research shows that students whose parents have gone to college are more likely to attend college themselves.¹⁷ Students are also influenced positively or negatively by the people they encounter at school and in their community. Patricia Gándara and Deborah Bial, for example, state that many students face impediments such as limited cultural supports, community resources, and peer supports, as well as racism, ineffective counseling, and limited networking opportunities with people who have succeeded in college.¹⁸ Finally, college readiness can be influenced by noncognitive skills that differ at the individual level and may be related to both schooling and family background. Arthur Costa and Bena

Kallick coined the term “habits of mind” to describe a series of intelligent behaviors that would help people be better problem solvers and thus have more success in their lives.¹⁹ David Conley refines the concept to describe the habits of mind necessary to succeed in college including critical thinking, an inquisitive nature, a willingness to accept critical feedback, an openness to possible failure, and the ability to cope with frustrating and ambiguous learning tasks.²⁰

Are Current Measures of College Readiness Adequate?

With larger proportions of underserved student populations going to college, traditional indicators of academic preparation such as the SAT and ACT have come under fire. Critics are concerned that wealthier students have better opportunities to prepare for such tests, that the tests do not measure what is learned in the classroom, and that the tests are not strong predictors of how students perform in college.²¹ In addition, the large numbers of students who plan to attend community college generally do not take the SAT or ACT because these tests are not required for admission. Community colleges do use standardized tests after matriculation, such as the ACCUPLACER and COMPASS, to determine if students need to take remedial education in English language arts and mathematics and then to place students in the appropriate courses. As noted in the article in this issue by Eric Bettinger, Angela Boatman, and Bridget Terry Long, these tests also have been found to be poor predictors of how students will perform academically.²²

Frustrations with the limitations of standardized tests, together with new thinking and research on what it means to be prepared for college or a job right out of high school (commonly referred to as “college and career

readiness”), have led to efforts to develop new and more comprehensive measures. The Educational Policy Improvement Center (EPIC), Georgetown’s Center on Education and the Workforce, the Association for Career and Technical Education, ConnectEd: the California Center for College and Career, the Conference Board, the National Association of State Directors of Career Technical Education Consortium, the Secretary’s Commission on Achieving Necessary Skills, and Assessing and Teaching 21st Century Skills are among the groups and organizations that have developed new college and career readiness standards.²³ These standards include not only the English language arts and mathematics necessary for entering first-year college students to take college-level credit-bearing courses but other competencies as well. For instance, some focus on twenty-first-century expectations. While these standards vary depending on the organization that developed them, they generally focus on quantitative STEM (science, technology, engineering, and mathematics) knowledge and skills; technical content (this area applies to preparation for career and technical education courses and includes a range of career-specific knowledge and skills); broad transferable skills (such as productive dispositions and behaviors); habits of mind; and preparation for civic life (such as knowledge of the democratic process and civic engagement).²⁴ These categories are not mutually exclusive, and views differ about what each category comprises and how much weight each component in a category should carry. In addition, there is no consensus about whether college and career readiness are different and, if so, how they differ. If they are different, the concern is how schools can avoid curricular tracking by ethnicity and income levels. Moreover, if college and career readiness are different, it is not

clear whether a single framework can support opportunities for students to be ready to succeed at all postsecondary institutions and within all workforce opportunities. Finally, although these broadened definitions of college readiness are intriguing, it is unclear whether and how these notions may be incorporated into state educational policies or the assessment practices of typical high schools or school districts.

Finding the Right College Fit

A corollary to determining college readiness is the importance of helping students to find the right institutional fit, particularly for students from low-income families or families that do not have experience with college. “Fit” includes aspects of a postsecondary institution such as its cost, location, size, student-faculty ratio, counseling and advising services, student body composition (for example, institutions that primarily serve students from a particular racial, ethnic, or religious background, or single-gender institutions), and areas of study offered or special areas of focus.²⁵ Many traditionally underserved students often do not have the option to matriculate farther away than the closest community college or broad-access university because they need to stay close to home to contain costs or help their family. In addition, all students, but particularly students who are traditionally underrepresented in college, often do not know enough both about themselves and their future goals and about postsecondary institutions to analyze institutional fit.²⁶

An issue closely related to choice and fit is the tendency for some students to attend colleges that are less selective than those they are qualified to attend. This phenomenon, known as “undermatching,” refers to students who meet the admissions criteria for high-ranking

colleges and universities based on test scores, rigorous course taking, and grades but who instead go to less selective four-year colleges, two-year colleges, or no college at all.²⁷ Available research findings suggest that undermatching is particularly a problem for students of color and from low-income families. A descriptive study that used case studies to examine how social class and high school guidance operations interact to influence high school students' educational aspirations found that female students, African American students, and students from low-socioeconomic backgrounds are most likely to undermatch.²⁸ Analyses of longitudinal data suggest that students who undermatch are significantly less likely to graduate. In their study of sixty-eight public colleges and universities, including twenty-one flagship institutions in four states, William Bowen and colleagues found that students who attended the most selective colleges for which they were academically qualified were more likely to graduate than were similar students who undermatched by enrolling in colleges for which they were overqualified.²⁹

These findings, together with the well-documented pattern of students from middle- and upper-income families attending four-year institutions, while low-income students are concentrated in two-year community colleges, reflect major weaknesses in the college-choice process for many students, especially minority and low-income students.³⁰ The inequalities in college-going and success rates by ethnicity and income groups are stark. As of 2010, 60.5 percent of the college population was white non-Hispanic students, compared with 14.5 percent black students and 13.0 percent Hispanic students.³¹ Moreover, in 2009, only 55 percent of high school graduates from the lowest family income quintile enrolled

in college immediately after high school, compared with 84 percent of those from the most affluent families and 67 percent from middle-income families. These inequalities have helped to drive the growth of precollege outreach programs and large-scale interventions and reforms.

Interventions Designed to Boost College Readiness

A variety of programs are now available to help boost the college readiness of today's high school students. Current interventions and reform efforts use a range of strategies to attempt to address a wide variety of student needs regarding college readiness. Strategies range from academic preparation to psychosocial and behavioral supports and the development of appropriate habits of mind (such as organization, anticipation, persistence, and resiliency). While each intervention tends to focus on a distinct group of students and to emphasize different aspects of college readiness, there is considerable overlap in the strategies these efforts use in helping students have access to, be prepared for, and succeed in postsecondary schooling. In this section, we discuss some of the better-known programs; their strategies are summarized in table 1.

Federal TRIO Programs

Since 1965, an estimated 2 million students have graduated from college with the special assistance and support of federal TRIO programs, such as Upward Bound and Talent Search, which provide outreach and student services to individuals from low-income backgrounds, those with disabilities, and those who are first-generation college-going to help them successfully navigate their educational pathways from middle school through post-baccalaureate programs.³² Upward Bound academic preparation provides

Table 1. Strategies Used by Selected College Readiness Interventions and Reforms

Intervention reform strategy	Areas of student need					
	Better academic preparation	Increased psychosocial and behavioral support	Greater exposure to college	Better information about college and financial aid	Better alignment between high school and college assessment and curricula	Development of appropriate habits of mind
TRIO						
Upward Bound	✓	✓		✓		✓
Talent Search		✓	✓	✓		
GEAR UP	✓	✓	✓	✓		✓
Early College High School and Middle College High School	✓	✓	✓	✓	✓	✓
Dual Enrollment	✓		✓		✓	
Early Assessment Program	✓					✓
Default curricula	✓					✓

Source: Authors.

participants with instruction in mathematics, laboratory sciences, composition, literature, and foreign languages. It also offers academic and social support through tutoring, counseling, mentoring, cultural enrichment, and work-study programs, and provides education to improve the financial and economic literacy of students. Talent Search provides students and their parents with information about college admissions requirements, scholarships, and financial aid. It also provides social support through counseling and helping students understand their educational options. Upward Bound and Talent Search both include services designed for disconnected student groups, such as students who drop out of high school, students who have limited English proficiencies, students from groups that are traditionally underrepresented in postsecondary education, students with disabilities, homeless students, and students who are in foster care or are aging out of the foster care system.

Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP), a federal program established by Congress as part of the 1998 reauthorization of the Higher Education Act, provides six-year grants to states and to partnerships (among local elementary and secondary schools, institutions of higher education, and community organizations) to serve cohorts of students attending high poverty schools beginning no later than the seventh grade and following them through high school. In contrast to programs such as Upward Bound that focus on academic preparation, GEAR UP programs take a more systemic approach by providing college scholarships, academic support services and counseling, and college-related information. They also attempt to work with the parents and families of the students.

Funding for these programs, however, is inadequate to reach all the students in need of them. In 2011, 951 Upward Bound programs served more than 64,000 students

nationwide, and more than 300,000 students in grades six through twelve across the nation were involved with Talent Search.³³ In 2010, Congress appropriated more than \$300 million for GEAR UP, which served 748,000 students through 42 state grants and 169 partnership grants.³⁴ Despite the large number of students being served by these programs, not all eligible students are being reached. According to the Council for Opportunity in Education, 11 million students are eligible for and need access to services through TRIO programs, but federal funding is sufficient to serve less than 7 percent of those eligible students.³⁵

Middle College and Early College High Schools; Dual Enrollment

The most comprehensive of all the efforts discussed here are Middle College High Schools (MCHSs) and Early College High Schools (ECHSs). These are small schools (the average size is around 250 students) that serve students historically underrepresented in college populations and that aim to coordinate student services, decrease repetition in curriculum, make college attainable, and eliminate the need for remediation. The first MCHS opened in 1974 at LaGuardia Community College in New York; there are now 40 MCHSs across the United States.³⁶ The ECHS Initiative, which builds off the MCHS model and is supported by the Bill and Melinda Gates Foundation, includes approximately 270 schools serving more than 75,000 students in 28 states.³⁷ Both models attempt to create strong college-going cultures throughout each school and to partner with colleges to provide dual-enrollment opportunities, college visits, and other connections with postsecondary education. Dual-enrollment courses are college-level courses, taught either in high schools or colleges, for which high school students receive both high

school and college credit. Typically, high school and college faculty work together to ensure that curricula and instruction within the high school align well with credit-bearing college-level coursework. Some ECHSs and MCHSs work with feeder middle schools to begin this “scaffolding,” or alignment, of curricula and instruction in earlier grades. Another difference from most large comprehensive high schools is that ECHSs and MCHSs try to provide students with a full range of support services, including advisory classes, college counseling, peer support, psychosocial and behavioral supports, and career experience opportunities for all students.³⁸

Dual-enrollment programs also provide opportunities for high school students to take college-level classes and earn both high school and college credit but without the additional supports of the MCHC and ECHS models.³⁹ Historically, dual-enrollment programs have been offered in highly resourced high schools with large percentages of students who matriculate into college. Increasingly, however, dual enrollment is being offered in high schools serving high-need populations. Students do not pay for the dual-enrollment courses, so they can accumulate free college credit in high school and potentially shorten the time it takes to complete a degree once they matriculate, therefore accelerating their progression from high school to and through college. A critical issue is that the standards for dual-enrollment courses must remain college level.

The U.S. Department of Education reports that as of 2005, 98 percent of community colleges and 77 percent of public four-year colleges were participating in dual-enrollment programs.⁴⁰ Most of these programs serve a relatively small number of students at specific

school sites, however. Thirty-eight states have policies that allow for dual enrollment, but some states will not allow both high schools and colleges to receive funding for the same course. Postsecondary faculty members teach some dual-enrollment courses, while others are taught by high school teachers who have completed training at the postsecondary institution that is providing the college credit. The kinds of courses offered through dual enrollment also vary a great deal. Some institutions provide access to any course requested by the participating high schools students, while others limit course options based on available sections and other factors. A growing number of dual-enrollment courses are in career and technical education.⁴¹

State-Level Reforms

More recently, various state-level reforms have emerged that address specific areas of college readiness through key leverage points within a state system. A growing number of these programs focus on students' academic preparation and better alignment between high schools and colleges in the curricula and assessment tools they use. One example is the implementation (typically statewide) of default curricula, which attempt to eliminate tracking in which some high school students complete a college preparatory curriculum while others complete a set of courses that does not prepare them well to succeed in education or training past high school. Instead, these states are requiring all high school students to enroll in coursework that aligns with postsecondary entrance requirements. By 2015, at least twenty-one states and the District of Columbia will have default curriculum requirements in place; these typically call for four years of English and mathematics and at least three years of science or social science, or both.⁴²

Another state-level reform effort receiving attention is California's Early Assessment Program (EAP), a collaborative effort that started in 2004 among the state board of education, the California Department of Education, and the California State University system. The EAP provides an assessment of college readiness in English and mathematics for one system of higher education in California (the state universities) to help students prepare for placement exams before they enroll in college and thus avoid the need for remediation once they reach college. The EAP uses students' scores on California's eleventh-grade assessment as indicators of students' readiness for college-level work in the state university and community college systems. Incoming high school seniors receive notification in August before their senior year about their level of readiness and the courses they can take to improve their academic preparation. Students who score high enough on the EAP (or on the SAT or ACT) are exempt from taking postsecondary placement tests and can go right into college-level courses.⁴³

Evidence on Effectiveness

Although they employ a range of strategies, these programs all share the same aim: to increase the rates at which participants complete high school and enroll in and graduate from college. Rigorous evidence regarding the effectiveness of these postsecondary readiness reforms is relatively small, however. As a result, we focus on results from those studies that used the most rigorous methods available. To begin, we discuss two TRIO programs focused on connecting high school students from low-income and first generation college-going families to college—Upward Bound and Talent Search; we then present findings on GEAR UP. We also summarize research on MCHCs and ECHSs to provide

information and evidence about systemic approaches, but evaluations of systemic reform efforts tend to be less rigorous, both because a control or comparison group is not easy to construct and because methodologically sound evaluations are often unaffordable for small-scale precollege outreach programs.⁴⁴

From a methodological perspective, experimental design is particularly useful when addressing evaluation questions about the effectiveness of programs or other interventions, because it provides the strongest data possible about whether observed outcomes are the result of a given program or innovation. Experimental designs include the random assignment of students either to a treatment group, which receives the intervention, or a control group, which does not. Any variation in outcomes may be attributed to the intervention.⁴⁵ When it is not feasible to assign participants randomly to treatment and control groups, researchers may use quasi-experimental designs, including regression discontinuity, difference-in-difference, interrupted time series, and propensity score matching. Regression discontinuity is differentiated from the other quasi-experimental designs because researchers maintain control over the treatment; participants are assigned to a program or comparison group on the basis of a cutoff score on a preprogram measure.⁴⁶

Evaluations of Upward Bound, Talent Search, and GEAR UP have yielded mixed findings on the programs' impact on the high school courses participants take—the number one predictor of college readiness.⁴⁷ Results on longer-term outcomes for Talent Search have been more positive, however. For example, two quasi-experimental studies of Talent Search in Texas and Florida that

included about 5,000 Talent Search participants along with a comparison sample of more than 70,000 students created through propensity score matching report positive effects on high school completion and college enrollment. In both cases, Talent Search participants completed high school at a significantly higher rate (86 percent in Texas; 85 percent in Florida) than did comparison group students (77 percent in Texas; 70 percent in Florida).⁴⁸

Evaluations of Upward Bound, Talent Search, and GEAR UP have yielded mixed findings on the programs' impact on the high school courses participants take—the number one predictor of college readiness. Results on longer-run outcomes for Talent Search have been more positive, however.

In contrast, findings for postsecondary enrollment and completion were more mixed for Upward Bound participants. Mathematica Policy Research conducted a randomized assignment study with a nationally representative sample of sixty-seven Upward Bound projects hosted by two- and four-year colleges and universities. Researchers found that the program had no detectable effect on the rate of overall postsecondary enrollment, the type or selectivity of the postsecondary institution attended, or the likelihood

of earning a bachelor's or associate's degree. However, the program was found to have positive effects on postsecondary enrollment and completion among the subgroup of students with lower educational expectations upon entering the program, that is, the students who did not expect to complete a bachelor's degree. The study also found that longer participation in Upward Bound was associated with higher rates of postsecondary enrollment and completion.⁴⁹ It appears that a key strength of the program is positively influencing students' educational expectations. Findings from the first phase of the Mathematica study found that, in general, program participants had higher expectations related to educational attainment.⁵⁰

To date, no large-scale study has tracked GEAR UP participants to the point of high school graduation; however, across three quasi-experimental studies of GEAR UP (using a sample of eighteen middle schools and eighteen matched comparisons), GEAR UP participants generally showed modest but positive outcomes related to academic performance by the end of eighth grade.⁵¹ The studies also found positive outcomes for tenth-grade participants related to academic performance, course-taking patterns, and college plans.⁵² Despite these intermediate student outcomes, most differences between GEAR UP participants and comparison groups were not statistically significant on outcomes related to overall academic performance, odds of being college-ready in English or reading, and taking the core high school curriculum or having plans for college.

Very few rigorous studies have evaluated the impact of the ECHS and MCHS models on college readiness outcomes, and findings from studies that have been conducted are mixed. A randomized trial on the

impact of North Carolina's ECHS model on ninth-grade student outcomes found that, compared with control-group students, a higher proportion of ECHS students were taking core college preparatory courses and succeeding in them; the difference was substantial and statistically significant.⁵³ In terms of high school graduation and college enrollment and success, a randomized controlled trial of 394 students in the Seattle Public Schools (in which a lottery was used to place students into MCHSs or regular high schools), found minimal, nonstatistically significant effects of the MCHS on students' staying in and completing school. Specifically, 36 percent of the MCHS students dropped out of school, compared with 33 percent of control group students; and 40 percent of the MCHS students earned a high school diploma or GED (General Educational Development) certificate two years after random assignment, compared with 38 percent of control group students.⁵⁴

To date, the studies evaluating the impact of ECHSs and MCHSs on college outcomes have been primarily descriptive. While the findings look positive, they may also be overly optimistic given the likelihood that those participating in the programs may have done better than the comparison group even without participating in the program. Both models appear to increase the rate at which participants take college-level courses and earn credits while in high school, but participants' longer-term success once in college may be less promising. A documented issue is a decline in ECHS and MCHS students' academic performance over time, particularly when they transition from high school to college. A longitudinal, descriptive study of a 2006–07 cohort of ECHS students found a decline in grade point average (GPA) over time; in particular, as the students moved

from twelfth grade to the first year in college, the average student GPA dropped from 2.63 to 2.48.⁵⁵ In addition, the credits that the students in these models earned in high school may not transfer once they enroll in college; thus, these students are not earning college credit free of cost to them.⁵⁶ The decline in student outcomes once they are out of the “high expectation and high support” environment has implications for future high school reform efforts and for the role of the postsecondary system in supporting students once they matriculate.

To date, no randomized trials have been conducted on the effects of dual enrollment. A series of five state case studies has provided descriptive evidence that dual enrollment is an effective strategy for helping students make a better transition to college and to persist in college once they are there, particularly for lower-income students and for males.⁵⁷ Recently, the Community College Research Center (CCRC) published findings from a three-year evaluation that tracked outcomes for thousands of students in career-focused dual-enrollment programs in California. The study found that students who completed dual courses were more likely to graduate from high school, enroll in a four-year postsecondary institution, and persist in college. They were less likely to be placed into developmental education, and they earned more college credits than did comparison students.⁵⁸ Similarly, research by the CCRC at the City University of New York (CUNY) found that students who completed one or more CUNY dual-enrollment courses earned more credits and had higher grade point averages than did students who did not complete such courses. The study controlled for demographic and academic achievement factors and had a large sample size (almost 23,000 students), thus increasing

the researchers’ ability to estimate program effects.⁵⁹ Because the CCRC studies did not use a random assignment design, they cannot control for motivation or other unmeasured differences between dual-enrollment students and those in the comparison groups.

As for statewide programs, a quasi-experimental study of the California EAP with a treatment-comparison design found that the program reduced students’ need for remediation by 6.1 percentage points in English and 4.1 percentage points in mathematics.⁶⁰ However, several variables are at play once students get an EAP score at the end of the junior year, including the availability of high-level English and mathematics courses during the senior year. In theory, if students have access to these courses, their need for remediation will likely decrease. But lack of resources and training for teachers who teach the on-site courses makes this access less of a reality for many students across California.⁶¹

Christopher Mazzeo and his colleagues at the Consortium on Chicago School Research studied a Chicago public schools reform that required a default curriculum for all students entering ninth grade in 1997 or later. The researchers compared students’ outcomes in English, mathematics, and science before the policy was implemented with outcomes afterward. They found that students were more likely to earn college preparatory English and mathematics credit by the end of ninth grade after the policy than before it, but test scores did not increase. Grades declined for “lower-skilled” students, and those students were significantly more likely to fail their ninth-grade mathematics or English courses. Absenteeism increased among students with stronger skills in both subjects, and students were no more likely to take the most rigorous mathematics

classes. Finally, the policy shift was found to have negative effects on high school graduation and postsecondary enrollment rates. Students who earned a B or better were less likely to go to college after the reform than before the reform.⁶² The researchers posited that the schools that have traditionally offered the most rigorous courses might be the ones that have the best capacity to teach them; spreading those requirements to other schools without the right capacity-building opportunities might result in ineffective curricula and pedagogy. Default curricula reforms typically are not accompanied by changes in school- and classroom-level capacity or by instructional reforms.⁶³

Summary of Lessons from the Intervention Studies

Given the range of major reform efforts in place in primary and secondary schools to help more students become college-ready and the equally varied level of evidence available on each, it is difficult to isolate individual strategies that are more or less effective. Looking across the spectrum of efforts and research, however, the strengths of specific interventions appear to lie in their ability to target subgroups of students (for example, Upward Bound students with low educational expectations), to offer thorough support in specific areas (Talent Search participants were more likely than nonparticipants from similar backgrounds to be first-time applicants for financial aid),⁶⁴ and to provide prolonged support (longer program participation in Upward Bound is linked to positive outcomes). The length of time spent in certain programs seems to be a crucial factor in increasing students' postsecondary enrollment and completion. Research on California's EAP highlights the need for building capacity in classrooms and schools and surrounding supports such as instructional reforms

in order to make meaningful improvements in college readiness.⁶⁵ And while ECHS and MCHS models appear to increase the rate at which participants take college-level courses and earn credits while in high school, the longer-term success of these students once in college appears less promising.

"It should not be surprising," concludes an influential federally funded descriptive study of precollege outreach programs, "that these early intervention programs appear to have little influence on academic achievement. They tend to be peripheral to the K[kindergarten]-12 schools. They augment and supplement what schools do, but do not fundamentally change the way schools interact with students."⁶⁶ Current changes in federal and state policies attempt to reform how high schools provide opportunities for students to learn high-level content, aligned with college and career expectations, in a way that is integrated within the school day for all students (as opposed to programs for a small proportion of students). There is also increasing awareness in the field that students need more psychosocial and behavioral supports.

While resource limitations can affect the extent to which different interventions can be integrated to create a more comprehensive approach, over the past ten years, interest has been growing in finding more widespread systemic and holistic approaches to college readiness. The Common Core State Standards, discussed next, are being implemented in most states but focus primarily on academic knowledge and skills; examples of more systemic approaches include college-preparatory charter schools such as Alliance College-Ready Public Schools, Aspire Public Schools, Green Dot Public Schools, High Tech High, and KIPP Public Charter Schools.

Systems Reform and the Common Core State Standards

In an effort to create more consistency nationally, and to align expectations across high schools, colleges, and entry-level workforce opportunities, the National Governors Association and the Council of Chief State School Officers are leading the Common Core State Standards (CCSS) Initiative. The initiative embodies a set of goals and expectations in English language arts and mathematics designed to align with college and career readiness by the end of twelfth grade.⁶⁷ To date, they have been adopted by forty-five states and three territories.⁶⁸ Many current school accountability systems focus on the educational floor for high school graduation (minimum academic standards), not the ceiling (postsecondary readiness), but those systems will need to change to align with the CCSS. Because states are currently in the process of implementing the CCSS, there is no evidence yet regarding the effectiveness of the strategy, although states have been experimenting with standards-based reforms since the 1990s.

The CCSS initiative is intended to provide a framework for the development and implementation of more detailed curricula.⁶⁹ The goal is to move schooling more in the direction of greater cognitive challenges for students and clearer focus on key content. The standards aim to help students increase communication and critical thinking skills and learn deep content knowledge. Because standards alone will not shift student learning, the success of the CCSS depends on how they are implemented and whether the assessments are summative, formative, or both. Supporters intend the CCSS to have the potential, for example, to enable teachers to focus less on lectures and more on

coaching and facilitation, to help students take greater responsibility for their learning, to increase rigor in core subject areas, to help students learn how to construct arguments and critique others' reasoning, and to move away from rote memorization (what and when) toward a deeper understanding of why and how.⁷⁰

The CCSS initiative acknowledges that college readiness requires students to go beyond rote memorization and to learn not only key content knowledge but also to develop skills around such abilities as effective analysis, communication, interpretation, and synthesis of information. The standards, however, are structured entirely around core subject areas at a time when increasing attention in policy and research circles is being focused on habits of mind related to college readiness, and those are not explicitly included in the CCSS.⁷¹

It is too soon to know if efforts to use college and career readiness standards to drive improved opportunities for high school students will make a difference in the percentage of students who succeed in postsecondary education. It is not known if these new tools can be implemented successfully at the desired scale, or if they will do a better job of teaching students about—or helping them attain—college readiness. Many questions remain: If postsecondary readiness and career readiness are the same, do broad similarities in the knowledge and skills necessary hold true across all fields and job types? If they are different, how can schools provide opportunities for students to become college- and career-ready, while affording all students the opportunity to explore their options and not end up tracked in a particular area?

More generally, many state-level officials are concerned that current budget constraints will impede states' abilities to support the kinds of professional development opportunities and other supports necessary for schools and educators to successfully implement the CCSS. A 2012 survey of deputy state superintendents of education by the Center on Education Policy found that twenty-one states are experiencing challenges in having the resources necessary to implement the CCSS and that twenty states are worried they will not have enough computers for the CCSS-aligned assessments scheduled to be ready in 2014.⁷²

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Conclusion

Given the implementation of the CCSS, the next few years are a critically important period in which to advance public discourse on college readiness. Capacity building for states, districts, schools, and educators is paramount to ensure that the new standards drive significant changes in what and how students learn and that the changes are aligned with postsecondary expectations.

The changes must go beyond teaching and learning in core subject areas. In addition to directly supporting academic preparation for students, capacity-building efforts need to focus on ensuring that large comprehensive high schools have strong college-going cultures, on providing the necessary professional development for educators to help all students meet college readiness standards, on supporting the development of strong habits of mind for all students, and on providing students with the information and supports to help them select the most appropriate postsecondary institution. Across the country, precollege outreach programs of all sizes are working on one or more of these issues, but the scale of those combined is small relative to the need.

Primary and secondary schools usually function in a different system from postsecondary institutions, with different leaders, priorities, incentives, accountability mechanisms, financial systems, data systems, norms, academic expectations, ways to measure progress and success, and pedagogies or instructional strategies. The separation between the two levels might have made sense decades ago, when the majority of students who went to college had the most "college knowledge"—the best abilities to navigate college academically, financially, socially, and psychologically. But today that separation contributes to the exacerbation of inequalities for a large and growing proportion of college students.⁷³ The CCSS should help bridge that divide. But to effectively connect the primary and secondary systems to the postsecondary education system and ensure that students are receiving the opportunity to prepare well for some form of postsecondary education, greater consensus is needed about what it means to be college- and career-ready, and higher education needs to play a more active role in reform

efforts. Currently, that role with regard to the implementation of the CCSS is unclear.

It is also not clear how a set of high-level standards will drive the kinds of capacity building, instructional change, and development of student supports writ large that will be required to move the needle on postsecondary readiness and success. Nor is it clear what the educational context that surrounds the CCSS will look like—will the focus in high schools be primarily on core academics? Will it include applied pathways that connect with postsecondary programs of study? Will primary schools be able to provide supports around the development of habits of mind, given that those behaviors and understandings need to start to develop before high school?

If the CCSS initiative is to help schools prepare larger numbers of students for postsecondary education, the new standards will need to be implemented with strong scaffolding—connecting curricula and instruction up and down the system—so that educators are able to provide the appropriate college readiness opportunities for students. The instruction will need to be supplemented by, or integrated with, the kinds of supports and other interventions currently offered by strong precollege outreach programs and school reform models. Currently, there are no national or state standards for capacity building, student supports, or the development of habits of mind. Given the complex issues involved in helping a larger percentage of students become ready for, and succeed in, some form of postsecondary education, perhaps it is time to consider how those activities can be supported in schools and integrated into the implementation of the CCSS.

Beyond standards, other widespread efforts to help students better navigate the divide between secondary and postsecondary education, such as dual enrollment, point to the challenges inherent in cross-system initiatives, as well as to opportunities to better connect the resources and knowledge within both secondary and postsecondary systems. Central to these streamlining efforts are considerations of how best to address the full range of student needs, including integrating academics with comprehensive support, so that students are prepared to be successful in college. The research, although limited, on federal intervention programs highlights the importance of length of time in a program for student outcomes related to credit accrual, high school graduation, and college enrollment. Looking for ways to leverage funds to extend the length of these programs and to target and involve students earlier would be worthwhile.

Consistent with the nation's history of decentralized control of education, no one reform model or intervention will work in every school or meet the needs of all students. While great variation in approaches and implementation strategies will no doubt continue, the field would benefit from a more comprehensive and consistent method for learning what works across different types of reforms—for example, using similar definitions and metrics—to help clarify what is transportable, effectively, across different contexts and scaling needs. Finally, it seems likely that to support postsecondary readiness for more students, reforms should take a systemic, comprehensive approach to provide students with both academic and nonacademic resources and opportunities.

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For-Profit Colleges

David Deming, Claudia Goldin, and Lawrence Katz

Summary

For-profit, or proprietary, colleges are the fastest-growing postsecondary schools in the nation, enrolling a disproportionately high share of disadvantaged and minority students and those ill-prepared for college. Because these schools, many of them big national chains, derive most of their revenue from taxpayer-funded student financial aid, they are of interest to policy makers not only for the role they play in the higher education spectrum but also for the value they provide their students. In this article, David Deming, Claudia Goldin, and Lawrence Katz look at the students who attend for-profits, the reasons they choose these schools, and student outcomes on a number of broad measures and draw several conclusions.

First, the authors write, the evidence shows that public community colleges may provide an equal or better education at lower cost than for-profits. But budget pressures mean that community colleges and other nonselective public institutions may not be able to meet the demand for higher education. Some students unable to get into desired courses and programs at public institutions may face only two alternatives: attendance at a for-profit or no postsecondary education at all.

Second, for-profits appear to be at their best with well-defined programs of short duration that prepare students for a specific occupation. But for-profit completion rates, default rates, and labor market outcomes for students seeking associate's or higher degrees compare unfavorably with those of public postsecondary institutions. In principle, taxpayer investment in student aid should be accompanied by scrutiny concerning whether students complete their course of study and subsequently earn enough to justify the investment and pay back their student loans. Designing appropriate regulations to help students navigate the market for higher education has proven to be a challenge because of the great variation in student goals and types of programs. Ensuring that potential students have complete and objective information about the costs and expected benefits of for-profit programs could improve postsecondary education opportunities for disadvantaged students and counter aggressive and potentially misleading recruitment practices at for-profit colleges, the authors write.

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During the past fifteen years, youth from minority and disadvantaged backgrounds and those ill-prepared for college increasingly and disproportionately have enrolled in programs at for-profit colleges. These programs promise much, are often open to those who do not meet traditional college-entry requirements, and are largely funded by federal student financial aid, particularly federal grants and loans. We analyze the rapid growth of for-profits, look more closely at the students who enroll in them, and assess their role in providing the skills of tomorrow to the youth of today.

What Are For-Profit Colleges?

For-profit sector institutions are a varied group. The sector contains the largest schools by enrollment in the United States and also some of the smallest. For example, the University of Phoenix Online program enrolled more than 532,000 students during the 2009 academic year, and the largest fifteen institutions, taken together, account for almost 60 percent of for-profit enrollments.¹ Yet, in the fall of 2009, the median enrollment in all for-profit institutions eligible to accept federal student aid under Title IV of the Higher Education Act was just 172 students.² For-profit schools, also known as proprietary institutions, offer a wide array of programs, from doctorates to certificates earned in a year or less, in fields ranging from health care and business to information technology and graphic design to cosmetology and cooking.

The for-profit sector has existed for more than a century in the form of “career colleges,” proprietary institutions that mostly have offered short courses in applied fields and served local labor markets. Yet, today, for-profit higher

education has become, in many people’s minds, synonymous with large brand-name institutions that have rapidly expanded their presence in the bachelor’s degree and graduate education markets. For-profit chains led by online institutions have experienced phenomenal growth in the past several decades.³ Enrollment in the for-profit sector has more than tripled since 2000, and large national chains are responsible for nearly 90 percent of this increase.⁴ Thus the current incarnation of the for-profit sector is big business; the sector’s largest providers are highly profitable, publicly traded corporations.⁵

In the past decade, the federal government has greatly expanded the funding of student aid under Title IV to increase access to postsecondary education. From 2000–01 to 2010–11, real federal expenditures on the Pell Grant program more than tripled from \$10 billion to \$35 billion (in 2010 dollars) and real Stafford Loan volumes more than doubled from \$37 billion to \$86 billion.⁶ In contrast, from 2000 to 2010, state tax appropriations for higher education increased by only about 5 percent in real terms, with zero real growth since 2007.⁷ Thus, the large recent increase in federal higher education spending has coincided with a tightening of state budgets.

In the face of sluggish growth in state funding for public institutions, for-profit colleges have grown rapidly to meet demand and have taken advantage of expanded federal student aid. Proprietary institutions increased their share of the total fall enrollment in Title IV–eligible institutions from about 4 percent in 2000 to nearly 11 percent in 2009.⁸ For-profit colleges were responsible for nearly 30 percent of the total growth in postsecondary enrollment and degrees awarded in the first decade of the twenty-first century.⁹

Finely attuned to the marketplace, the for-profits are quick to open new schools, hire faculty, and add programs that train students for jobs in fast-growing areas such as health care and information technology. They provide identical curriculum and teaching practices at multiple locations and at convenient times, and they offer highly structured programs that make timely completion feasible.¹⁰ In principle, such responsiveness to employer and student demand leads to greater innovation and efficiency in the marketplace for higher education. Yet the vast bulk of revenue among large for-profit chains derives from federal student aid, potentially reducing customer (student) sensitivity to price and quality. Many of the chains have developed business strategies that involve heavy investments to expand enrollment. Indeed, audit studies have shown that some for-profits have engaged in highly aggressive recruiting techniques, some of which border on fraudulence.¹¹

The snippets of available evidence suggest that the economic returns to students who attend for-profit colleges are lower than those for public and nonprofit colleges. Moreover, default rates on student loans for proprietary schools far exceed those of other higher-education institutions. Although for-profit colleges have had strong financial incentives to innovate in ways that increase enrollments, the rapid growth of the sector may have eroded program quality. A challenge for federal regulation of the for-profit sector is to design incentives for improved quality, while still preserving access for students from disadvantaged and nontraditional backgrounds.

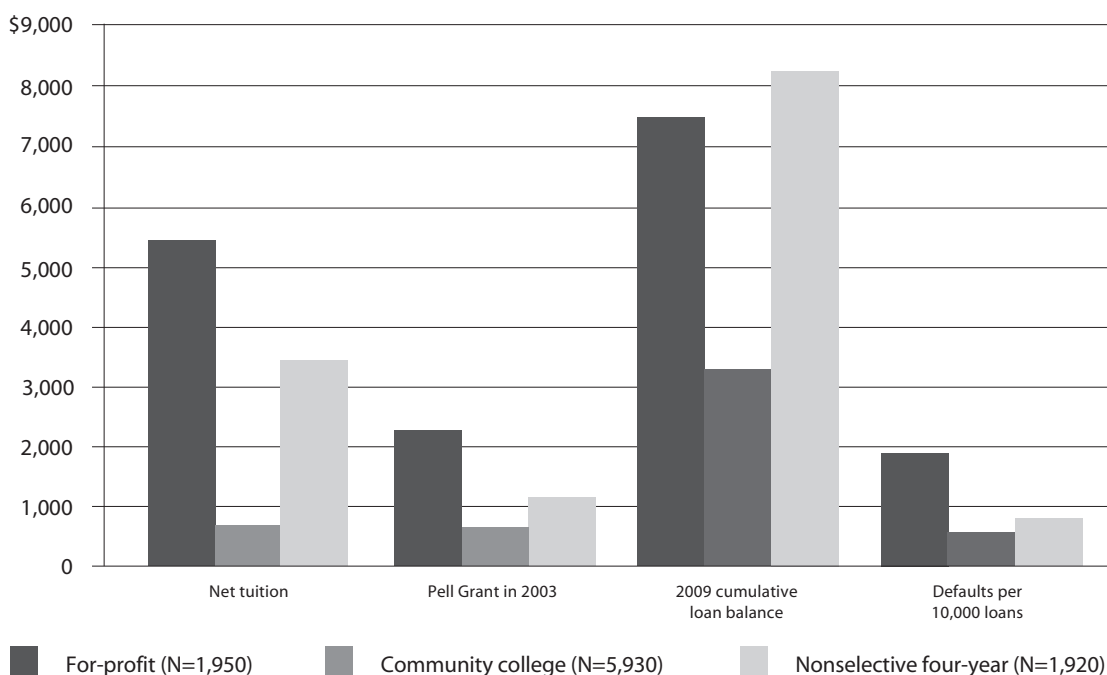
Who Are the Students?

Students in for-profit colleges are disproportionately older (65 percent are twenty-five or older), African American (22 percent), and female (65 percent). For-profit colleges

also enroll a more disadvantaged group of beginning undergraduates than do other postsecondary schools.¹² Student characteristics can be gleaned from the Beginning Postsecondary Students (BPS) longitudinal survey for 2004–09. This survey follows a nationally representative sample of first-time, full-year undergraduates who began their postsecondary schooling in the 2003–04 academic year. For-profit colleges, particularly those that specialize in online education, also enroll many part-time and returning students. These two groups are not represented in the BPS data, however, and the comparisons below do not apply to them.¹³

Only 75 percent of first-time undergraduates enrolled in for-profit colleges have a high school diploma, compared with 85 percent of students in community colleges and 95 percent in public or nonprofit four-year colleges (most of the other undergraduates have a General Educational Development diploma, or GED). Dependent students in for-profit colleges have about half as much family income as students in community colleges and nonselective four-year public or private nonprofit colleges. Finally, students in for-profits are two and half times more likely than community college students to be single parents (29 percent versus 12 percent).¹⁴ Despite the low-income status of most of their clientele, for-profit colleges are far more expensive than their counterparts in the public and nonprofit sectors. The first two sets of bar graphs in figure 1 show differences in net tuition (tuition minus grants) by type of institution and in the average Pell Grant award for BPS students in 2003, their first year of enrollment. (The figure excludes selective four-year institutions to which most students at for-profits would not be admitted.) Net tuition at proprietary schools averaged a bit more than \$5,500 in

Figure 1. Student Finances by Type of Postsecondary Institution, for First-Time Students in 2003



Source: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students (BPS) 04/09 Longitudinal Survey.

Note: Figures are weighted to be nationally representative of first-time, full-year undergraduates in fall 2003. Net tuition is calculated as tuition minus total grants (including Pell Grants). The 2009 cumulative loan balance and default measures include only loans from federal Title IV sources. Net tuition, Pell Grants, and cumulative loan balance are in "current" dollars. See table 1 for definition of nonselective four-year institutions.

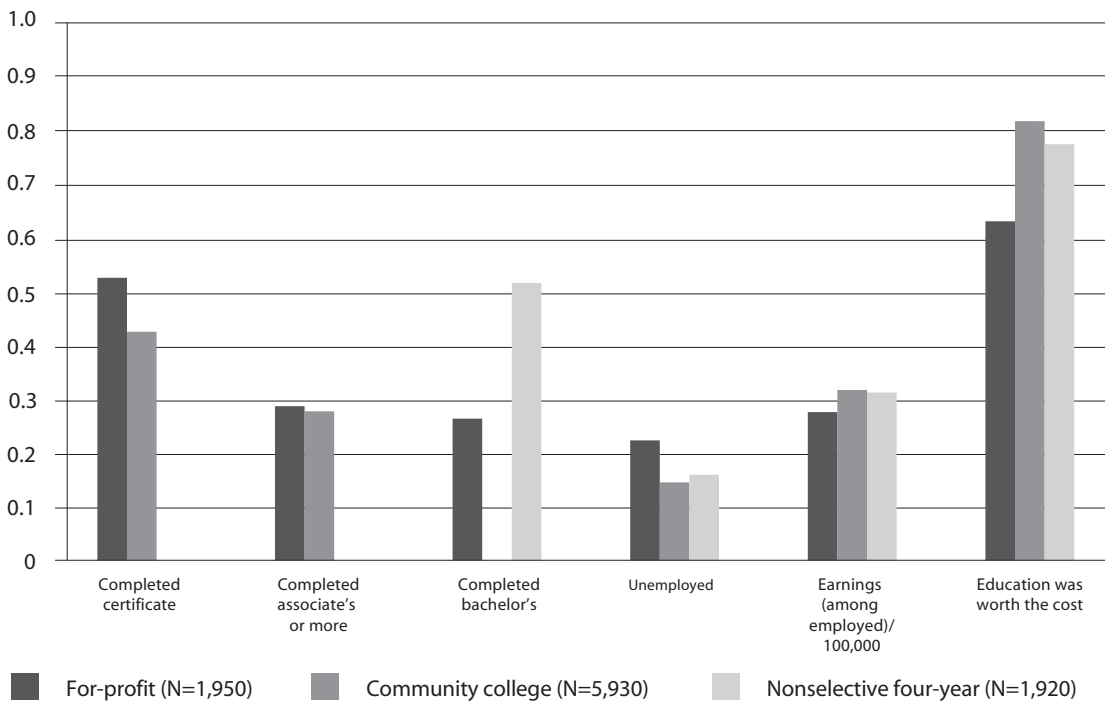
2003, compared with just under \$3,500 at nonselective four-year public and nonprofit colleges, and less than \$750 at community colleges.¹⁵ The average Pell Grant award for students at for-profits (including those not receiving grants) was \$2,149, more than three times the average award for students in community colleges and twice as large as that for students in nonselective four-year schools.

Students leave for-profit colleges with higher levels of debt than students from the other types of institutions and are more likely to default on their student loans (see the last two bar graphs in figure 1). Six years after initial enrollment, students at nonselective four-year

colleges have federal student loan balances similar to those of students at for-profits (\$8,153 and \$7,460, respectively). But many for-profit students enroll in just one- or two-year programs. Therefore, the debt burden per year of postsecondary education is higher at the for-profit institutions. Nearly 20 percent of first-time undergraduates at for-profits default on a federal loan within six years of enrollment, compared with 7 percent and 6 percent for borrowers at nonselective four-year and community colleges, respectively.¹⁶

Mean differences in degree and certificate attainment, employment, earnings, and satisfaction by institution type are shown in

Figure 2. Student Outcomes by Type of Institution



Source: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students (BPS) 04/09 Longitudinal Survey.

Note: Figures are weighted to be nationally representative of first-time, full-year undergraduates in fall 2003. Certificate completion covers only students starting in certificate programs; associate's or more completion covers those starting in associate's programs; and bachelor's covers those starting in bachelor's programs. The unemployed and earnings measures exclude students who report that they are still enrolled in school in spring 2009. To be able to include all variables on the same chart, earnings are scaled by 100,000; for example, \$20,000 is 0.2. See table 1 for definition of nonselective four-year institutions.

figure 2. About 54 percent of students who initially seek to enroll in certificate programs at for-profit colleges complete their course of study within six years, compared with just 42 percent at community colleges.¹⁷ Seekers of an associate's degree are more likely to complete their degree if they enroll in a for-profit college than in a community college. But because some community college students who originally enrolled in an associate's program go on to complete a bachelor's degree, there is no overall difference in any degree completion among associate's degree seekers at the two types of institutions. Only 26 percent of bachelor's degree seekers in

for-profit colleges complete within six years, compared with 53 percent at nonselective four-year public and nonprofit institutions.

Students who attended for-profit colleges are more likely to be unemployed and have lower earnings once they leave school than those in community colleges and other nonselective institutions. Six years after initial enrollment, 23 percent of students who had graduated or otherwise left for-profit colleges were unemployed and seeking work compared with about 15 percent in the other institutions. Among the employed, for-profit students had modestly lower earnings than those from

other sectors—\$28,000 compared with about \$31,000 for students from the comparison institutions. Students in the for-profit sector were less satisfied with their programs. Only 65 percent felt their “education was worth the cost” compared with about 80 percent in nonselective publics and nonprofits.

Although the comparisons are made across students in programs of different length, the main conclusions hold within certificate, associate’s degree, and bachelor’s degree programs, and the results are similar when alternative measures of employment and satisfaction are used.¹⁸

Economic Returns to Attending a For-Profit Institution

Do higher default and unemployment rates mean that for-profit colleges are failing students? Not necessarily. Students in for-profits tend to be in more precarious financial situations than other students before they enroll. Many of those from for-profits who defaulted on their loans or were unable to find work might have been in the same predicament even if they had attended a public or nonprofit institution. For-profit college leaders and their advocates argue that a fair comparison of loan default rates and other outcomes across types of institutions must account for differences in the characteristics of incoming students.¹⁹

In earlier work, we compared student outcomes across institutions after adjusting for type of degree or certificate program, degree expectations, and a wide range of student background characteristics, using both ordinary least squares regression and matching models.²⁰ Four main findings emerged. First, the cumulative federal student loan balances and the student loan default rates remained substantially higher for students attending

for-profits than for “comparable” students attending public and private nonprofit institutions.

Do higher default and unemployment rates mean that for-profit colleges are failing students? Not necessarily. Students in for-profits tend to be in more precarious financial situations than other students before they enroll.

Second, we found that for-profit colleges do a good job of graduating students from certificate and associate’s programs but a poor job of graduating them from bachelor’s programs within six years. Third, adjusting for student background characteristics and income before enrollment narrowed the gap in post-school employment and earnings outcomes by about 50 percent but did not eliminate it. Students in for-profit colleges still had lower earnings and were less likely to be employed six years after their initial enrollment, overall as well as within the certificate and degree groups. Fourth, statistical adjustment did not noticeably narrow the satisfaction gap for students in for-profit colleges; these students were still far less likely to be satisfied with their education or to believe that it was worth the financial investment.

Overall, little solid evidence exists on the economic returns to a for-profit education.

Existing research on this question combines two related approaches: analyses of the change in earnings for individual students measured before and after attending a for-profit institution, and comparisons of the earnings outcomes for students attending for-profits to those attending other postsecondary institutions.

Using the same 2004–09 BPS data source as we do here, Kevin Lang and Russell Weinstein found that, six years after program entry, those who had completed a certificate at a for-profit institution had no increase in earnings compared with students who began the course but did not complete it.²¹ Lang and Weinstein also found that those who completed an associate's program at a for-profit school had only modest (and not statistically significant) earnings increases relative to those who did not complete it. In contrast, they find large positive and statistically significant earnings increases for students completing an associate's degree in a public or nonprofit institution.

Using administrative panel data on earnings and enrollment from the Internal Revenue Service for a sample of 45 million individuals who enrolled as undergraduates from 1999 to 2008, Nicholas Turner found smaller returns for students in for-profit colleges compared with other types of institutions in a framework that compared earnings before and after attendance.²² In contrast, Stephanie Cellini and Latika Chaudhary compared the earnings trajectories of students from private and public two-year institutions using panel data from the 1997 National Longitudinal Survey of Youth and found that students completing an associate's degree at two-year private (mainly for-profit) colleges had about the same earnings increases as similar students at two-year public institutions.²³

We draw several conclusions from the nascent literature on economic returns to a for-profit education. Students attending for-profits wind up earning less than students from other types of institutions, and the change in their earnings after attending a for-profit appears to be less than or similar to the change in earnings from attending a nonprofit or public institution. The combination of equal or lower benefits and a higher cost of attendance suggests that for-profit institutions are not offering students as good a return on their investment as do other types of colleges. But because none of these studies has a strong experimental or quasi-experimental design, they should be used with caution. More research and more data are needed.

Because of data limitations, the existing literature has focused on overall mean comparisons of outcomes for students by college institutional control rather than by specific program. It is likely that some certificates and degrees awarded by for-profits are a good investment, whereas others are not. Future research should examine the extensive heterogeneity in programs in the for-profit sector.

Why Do Students Enroll in a For-Profit Institution?

Taking the evidence above at face value, we ask: If for-profit education is not a good investment relative to that from other types of institutions, why has for-profit enrollment grown so fast? Several explanations are possible.

Keeping Up with Employer Demand

For-profit colleges often specialize in short programs that are narrowly focused toward preparation for particular occupations. Because of that, they are often called career colleges. In the for-profit sector, an associate's degree typically serves as the terminal

credential for a particular occupation, whereas in the public and nonprofit sectors it is often a gateway to a four-year degree. Thirty-eight percent of associate's degrees granted by public and nonprofit institutions, but just 2 percent granted by for-profits, are in general studies and liberal arts. For-profits specialize in particular associate's degree programs. They produce 18 percent of all associate's degrees but account for 33 percent of those granted in business, management, and marketing; 51 percent in computer science; and 23 percent in the health professions.²⁴

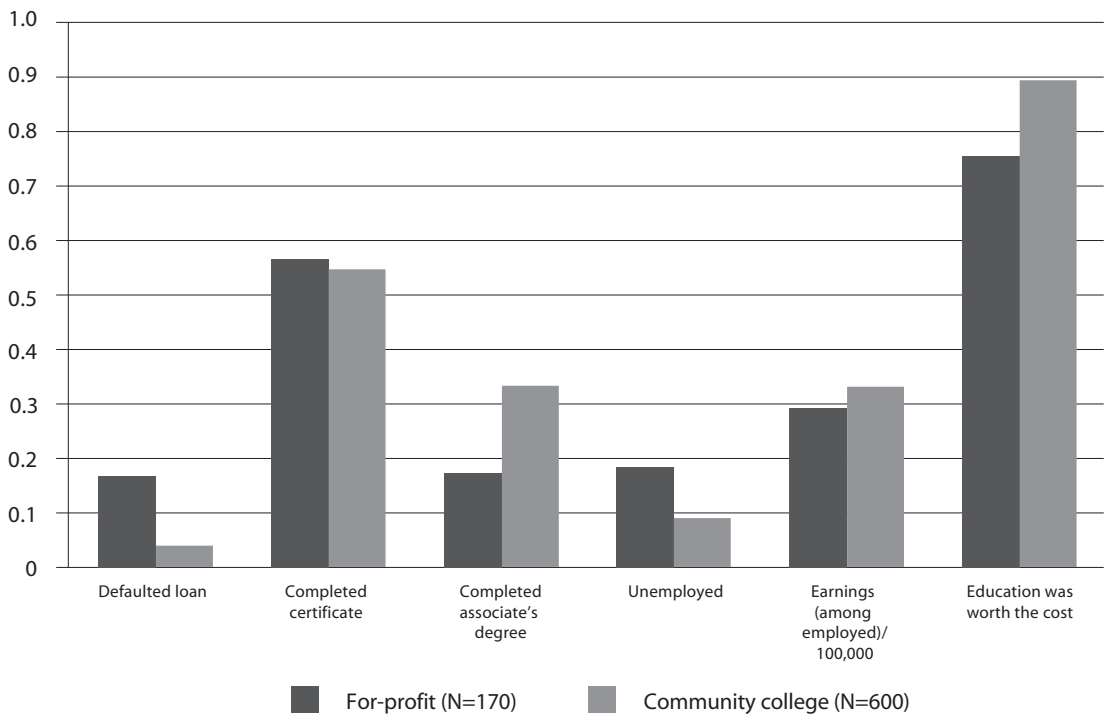
Many students in for-profit colleges enroll in short programs with a clearly defined curriculum (often geared toward training students to pass an occupational licensing exam) and specific job placement goals. To succeed, such programs must have close connections with industry, provide active help with job placement, and be able to adjust instruction rapidly to the changing needs of employers. Institutions must also be able to alter staffing and other resources to accommodate increases in demand for popular programs. For-profit colleges may do a better job than other institutions in expanding capacity in highly demanded occupations where jobs are plentiful. Furthermore, Sarah Turner found that for-profits are more responsive than public institutions in adjusting their enrollment capacities to indicators of aggregate student demand such as changes in the college-age population in a state.²⁵

Do students choose for-profit colleges because they offer programs that are more closely attuned to the current needs of employers? Do for-profits perform relatively better within these groups of programs? We address these questions by focusing on the health professions.

For-profits have moved nimbly into the health professions where job opportunities have been expanding. Ten of the twenty fastest-growing occupations in the United States are related to health care. Much of this growth has come in allied health care support occupations such as medical assistants, phlebotomists, and X-ray and ultrasound technicians, for which an associate's degree or a certificate is usually sufficient for employment.²⁶ Not surprisingly, given rapidly growing employer demand, overall postsecondary enrollment in health-related programs has doubled during the past decade. Growth has been relatively faster among for-profits—just over half of all students enrolled in such programs in 2009 were attending for-profits, compared with 35 percent in 2000. In the 2008–09 academic year, programs in the health professions made up the single largest field of study in for-profit colleges and the second-largest in community colleges.

How do these students fare in the labor market? Figure 3 compares outcomes for students enrolled in allied health programs in community colleges and for-profits. The pattern of results is qualitatively similar to those already seen for differences by type of institution across all programs. Student loan default rates are slightly lower in the health professions than overall, but the students in health fields at for-profits have a similarly higher default rate than those from community colleges as they do overall. The for-profit advantage is only about 2 percentage points for certificate completion in health programs and is reversed for associate's degree completion in these areas. In fact, students in a community college health program are more than twice as likely to complete their associate's degree than are students in health programs at a for-profit institution (35 versus 17 percent).

Figure 3. Outcomes of Students in Allied Health Programs



Source: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students (BPS) 04/09 Longitudinal Survey.

Note: Figures are weighted to be nationally representative of first-time, full-year undergraduates in fall 2003. Certificate completion covers only students starting in certificate programs; associate's or more completion covers those starting in associate's programs; and bachelor's covers those starting in bachelor's programs. The unemployed and earnings measures exclude students who report that they are still enrolled in school in Spring 2009. To be able to include all variables on the same chart, earnings are scaled by 100,000; for example, \$20,000 is 0.2. See table 1 for definition of nonselective four-year institutions.

Unemployment rates within each institution type are about 5 percentage points lower for the health professions than for all programs combined (compare figures 2 and 3). Still, students from for-profit health programs are more than twice as likely as students from community college programs to be unemployed (19 versus 9 percent), and those that are employed have about 12 percent lower earnings. Satisfaction rates for health programs are considerably higher than average, but the gap between community colleges and for-profits is still about 14 percentage points. In results not shown, we confirm that

statistical adjustment for student characteristics does little to change the magnitude of these differences.

In sum, we find that students enrolled in health-related programs at for-profit colleges have worse outcomes than community college students in similar programs. Based on these results, we conclude that the focus of for-profits on fast-growing occupations is unlikely to fully explain why a student would choose to enroll in a for-profit college if the student also had access to a comparable community college program.

Although much of the growth in for-profit college enrollment has come from online education, community colleges also offer many classes online. In fact, among first-time undergraduates in 2003, more than 13 percent of students at community colleges reported taking at least one class online, compared with only about 6 percent of students at for-profit colleges.

Better Guidance and Student Services

Another explanation for the popularity of the for-profits is that even though they offer programs similar to those at community colleges, the for-profits provide a more structured, supervised approach. In a comparative study of colleges in a major city, James Rosenbaum, Regina Deil-Amen and Ann Person found that students at what they call “private occupational colleges” (meaning for-profit, proprietary, or career colleges) had higher completion rates than students at community colleges.²⁷ The researchers demonstrated that, compared with community colleges, private occupational colleges undertook a more active role in guiding students through the process of enrollment and completion and that they more aggressively assisted with job search. But that

conclusion seems at odds with the finding that students at for-profit colleges have worse employment outcomes and are less satisfied with their programs.

One possible explanation, which the researchers themselves advanced explicitly, is that their study of a group of particularly strong private occupational colleges does not generalize to the for-profit sector overall.²⁸ In addition, their study took place between 2000 and 2002 at the beginning of the rapid rise in for-profit college enrollment, and they did not study the chain institutions in which most of the recent enrollment growth has been concentrated. Thus, the lessons they drew from comparing for-profits to community colleges may not hold today or for the for-profit sector as a whole.

A related possibility is that for-profit colleges do a better job of accommodating the busy schedules of older students by offering courses at flexible times such as nights and weekends. However, community colleges also offer courses at all hours. In 2009, the *New York Times* reported that some community colleges were holding classes nearly twenty-four hours a day to respond to enrollment spikes brought about by the economic recession. Bunker Hill Community College in Massachusetts offered classes from midnight to 2:30 a.m., as did Clackamas Community College in Oregon. Many other schools started their classes as early as 6 a.m.²⁹

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students at for-profit colleges. By fall 2011, 46 percent of community college students reported taking at least one class online.³⁰

Overcrowding at Community Colleges

Students might turn to for-profit colleges because local community colleges are overcrowded or otherwise unable to meet their needs. The past decade has seen stagnant or declining state funding of community colleges coupled with a growing demand for postsecondary education. With their open-access mission, community colleges face enormous pressure to accommodate more students despite having fewer dollars to do so. Not surprisingly, overcrowding of popular courses and programs has resulted. According to a nationally representative survey of U.S. community college students, 37 percent reported that they had been unable to enroll in at least one course during the fall 2011 semester because it was full, and 20 percent reported that they would have trouble enrolling in courses required for their degree or certificate.³¹

Even if students are able to enroll in a community college, they may have to take some remedial courses before they are able to start working toward a degree. Compared with for-profits, community colleges are more likely to require students to take remedial courses, which do not count toward a degree. Less than 8 percent of first-time undergraduates in for-profit colleges enrolled in remedial coursework in 2003–04, compared with nearly 30 percent in community colleges.

Lower rates of remediation at the for-profit institutions could reflect lower academic standards. On the other hand, the system adopted by many community colleges of assigning students to remedial coursework based on performance on a standardized

placement exam might be an inefficient use of resources. Students might turn to for-profit colleges for short programs, seeking to avoid extensive remediation at community colleges that could double the time it takes for them to earn a degree.³²

Higher education funding in California provides an instructive case study of how for-profit colleges might step into the vacuum created by shrinking public budgets. In response to an anticipated cut of \$825 million in 2009, the community colleges of California capped enrollment growth, cut hundreds of courses, and imposed a hiring freeze on lecturers and support staff.³³ In fall 2009, the California Community Colleges Chancellor's Office announced a partnership with Kaplan University, a large and predominately online for-profit university owned by the Washington Post Company, which is publicly traded. The agreement allowed students at certain community colleges to take online courses from Kaplan and receive credit that would transfer back to their institution.

Even though Kaplan gave California students a 42 percent discount, a three-credit course was still about eight times as expensive as one at a California community college (\$645 versus \$78).³⁴ The agreement lasted less than a year, mainly because community colleges were unable to guarantee that public four-year colleges in California would accept transfer credits from Kaplan. Still, Kaplan made inroads with community college students. Shortly after announcing the agreement, the for-profit created a new scholarship program “designed to help students affected by the fiscal crisis plaguing California’s state college system.”³⁵

The best evidence on the impact of state budgetary difficulties on students’ enrollment

choices comes from Stephanie Cellini, who found that for-profit colleges in California were more likely to enter local markets after community college bond referendums failed to pass.³⁶ With a strong research design based on a comparison of communities where bond initiatives barely failed to those where they barely passed, this study provides strong causal evidence of the connection between constraints on public sector funding and the growth of for-profit institutions.

Marketing and Recruitment Activities of For-Profit Colleges

A further possibility is that, in the face of limited information on the costs and benefits of different programs, student enrollment decisions may be greatly influenced by the advertising and recruiting efforts of for-profit colleges. All postsecondary institutions eligible for federal student grants and loans, including for-profits, are responsible for putting together a student's financial aid package from a mix of federal and state aid, institutional grants, and federal and private loans. Once schools assemble this information, it is presented to the student, who then decides whether to enroll (see the article on financial aid in this issue by Susan Dynarski and Judith Scott-Clayton). Institutional control of the assembly of financial aid packages has advantages given the complexity of the financial aid system. Yet it also creates potential conflicts of interest for the institution and incentives for aggressive and deceptive recruiting practices, especially if employee compensation is based on success in attracting students and getting the federal student aid that comes with them.

As early as 1991, the federal government attempted to regulate the use of incentive compensation for employees of for-profit colleges. The Higher Education Amendments of 1992 banned for-profit colleges from paying

commissions, bonuses, or any other form of compensation that is tied to enrollment or financial aid. Beginning in 2002, the ban on incentive compensation was gradually weakened by the creation of twelve "safe harbor" exceptions to the rule. For-profit colleges were permitted, for example, to adjust the wages of recruiters twice a year, so long as the adjustment was not "based *solely* on the number of students recruited, admitted, enrolled, or awarded financial aid."³⁷

A report issued in 2010 by the Government Accountability Office (GAO) revealed direct evidence of troubling recruiting practices at for-profit colleges.³⁸ The GAO sent investigators posing as prospective students to fifteen proprietary colleges and recorded their encounters with admissions personnel at each college. The colleges were not a random sample of for-profits. Rather, the GAO chose a mix of privately owned and publicly traded schools of various sizes, all of which either received 89 percent or more (the legal limit is 90 percent) of their revenue from Title IV federal aid or were located in a state that was among the top ten recipients of Title IV funding.

According to the GAO investigators, officials at four of the fifteen schools encouraged applicants to engage in outright fraud, such as not reporting savings, in order to qualify for federal financial aid. Personnel at all fifteen colleges made "deceptive or otherwise questionable" statements to undercover applicants. Examples included failing to provide information about the college's costs and past graduation rates (federal regulations require them to report this information) and understating tuition by using the cost for nine months of attendance when the program actually ran for twelve months. Some admissions staff pressured applicants to sign a

contract before allowing them to speak with a financial adviser.

Many for-profit colleges devote considerable resources to advertising, sales, and marketing. GAO investigators posing as prospective students entered their personal information on websites designed to match students to colleges based on their stated interests. These investigators were contacted repeatedly, some within five minutes of signing up. One received more than 180 phone calls in one month from a for-profit recruiter. Advertisements for proprietary institutions can be seen regularly on television, in subway stations and trains, and on interstate highway billboards. According to one study, thirteen large publicly traded for-profit institutions spent around 11 percent of revenue in 2009 on advertising. Altogether, about 24 percent of revenue was spent on sales and marketing (including advertising). The cost to recruit the average new student at a large national chain is around \$4,000, or about 25 percent of average annual tuition.³⁹

The combination of for-profit institutions' reliance on federal financial aid and use of incentive compensation in enrolling students creates incentives for overly aggressive student recruitment. In the 2009–10 fiscal year, 75 percent of revenues at for-profit institutions came from Title IV funding.⁴⁰ Federal regulation prevents for-profit colleges from relying on Title IV sources for more than 90 percent of revenue, and many large chains such as University of Phoenix (86 percent) and Kaplan University (87 percent) are very close to the statutory limit. Publicly traded companies that rely heavily on federal financial aid also have a fiduciary duty to maximize value for their shareholders. Expanding enrollment to capture the federal student aid of marginal students unlikely to benefit

economically from a program could prove to be a profitable strategy. When such institutional incentives are combined with outreach to low-income, first-generation college students who may be financially unsophisticated, the worry is that students may have overly optimistic views of the expected benefits and not fully understand the costs (for example, the difference between loans and grants) of the educational decisions they are making.

Career Orientation of For-Profit Colleges

The career-oriented approach and wide range of specific occupational training offered by for-profit colleges attract many students. But this focus comes with some costs, especially for first-time postsecondary students. Learning about one's own abilities and preferences to be able to make better-informed decisions about further education and career is a valuable part of initial college experiences. And such opportunities for exploration are more limited at for-profits. Part of the mission of a community college is to provide open access to a general liberal arts curriculum at a low cost so that students can learn whether a four-year degree is right for them. By not saddling students with high debt burdens, community colleges preserve the "option value" of further postsecondary education.⁴¹

Table 1 presents a transition matrix for students in the 2004–09 BPS categorized by initial program enrollment. Of all certificate seekers, 42 percent of those in community colleges and 53 percent of those in for-profits attained a certificate within six years. In addition, 41 percent of certificate seekers in community colleges, and 41 percent in for-profits, did not attain a certificate and were no longer enrolled at the end of six years. Community college students were more likely either to attain another degree or to still be enrolled (17 percent versus 6 percent).

Table 1. Transition Matrix of Initial Enrollment to Final Outcome (Percentage of those initially enrolled)

Outcome in Spring 2009	Initial Program Enrollment In Fall 2003					
	Certificate		Associate's degree		Bachelor's degree	
	Community college	For-profit	Community college	For-profit	Public or nonprofit four-year (nonselective)	For-profit
Attain certificate	41.9	53.3	7.2	7.6	2.8	1.6
Attain associate's degree	6.2	1.6	21.2	27.5	6.0	3.8
Attain bachelor's degree	1.4	0.0	10.0	3.3	39.9	26.0
Still enrolled, four-year	3.4	1.1	5.3	2.0	11.5	7.5
Still enrolled, not four-year	6.0	3.1	9.8	6.6	3.7	5.7
No longer enrolled	41.2	41.0	46.6	53.0	36.1	55.5

Source: U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students (BPS) 04/09 Longitudinal Survey.

Note: Figures are weighted to be nationally representative of first-time, full-year undergraduates in fall 2003. Each column sums to 100 and reports the six-year outcomes for students who begin enrollment in the indicated program and institution type. Rows are a mutually exclusive and collectively exhaustive set of possible outcomes following initial enrollment. The BPS defines nonselective four-year institutions as either having explicitly open admission or being in the bottom 15 percent of median SAT/ACT scores and in the bottom 15 percent of the share of applicants denied admission.

This pattern is even more pronounced among those beginning associate's programs. Students in for-profits were more likely to attain an associate's degree (28 percent versus 21 percent in community colleges), but they were also more likely to have left school without attaining any degree (53 percent versus 47 percent). Despite lower attainment of the initially sought-after degree, community college students who began in associate's programs were much more likely to consider it the first step of a longer educational journey. Fifteen percent of students in community colleges who initially enrolled in an associate's degree program had either attained a bachelor's degree or were enrolled in a four-year college at the end of six years. Lower tuition and the ability to attend school without borrowing large sums of money encourage such exploration.

In summing up the evidence on why students choose to go to for-profit schools, we reach the following conclusions. For-profit colleges offer a wide variety of programs and courses in fields that are in high demand among employers, such as health and information systems. But so do community colleges. Moreover, the two types of colleges do not seem to differ greatly in their ability to accommodate students with hectic schedules involving work and family demands. Both types of institutions offer courses at night, on weekends, and online.

The rise in for-profit enrollment coincided with the tightening of state higher education budgets and declining access to public institutions, especially community colleges. Their open-access mission means that few community colleges deny admission formally. But many students report that they are unable to register for required courses either because

the courses are full or because students must first complete (possibly needless) remedial coursework. These students may thus turn to for-profits as an alternative.

Some (perhaps many) students who choose to attend a for-profit institution may not arrive at that decision through a dispassionate and deliberate process of weighing costs and benefits. Even when costs and benefits are presented clearly and simply, education is an uncertain investment. The uncertainty is compounded by the incentives of for-profit colleges to grow student enrollment and capture the associated federal student aid dollars, and by the evidence that proprietary institutions do not always present information on financial aid packages in a neutral manner.

The GAO investigative report on recruiting practices at for-profits raises concerns that fraudulent and deceptive behaviors have been widespread.⁴² If true, many students who enroll in for-profit institutions may base their enrollment decisions on distorted information concerning the cost and expected benefits (in terms of graduation rates and future employment prospects and earnings) of their education. The GAO's sampling method was in some ways designed to focus on schools with the strongest incentives to apply pressure in recruitment of new students. Yet the fact that official personnel at all fifteen schools made "deceptive or otherwise questionable statements" to applicants suggests that these are unlikely to have been isolated incidents.

The highly focused career- and student-centered approach of most for-profit colleges provides a possible benefit relative to community colleges. But the lack of flexibility means that for-profit students forgo the option value of further education, and the expense of their programs means that

students may not have the luxury of exploring other educational and training opportunities. The flexibility of community colleges as well as their lower tuition helps to explain why their students are more likely subsequently to enroll in a four-year college and to complete a bachelors' degree.

The failed partnership between California community colleges and Kaplan University illustrates that for-profits and community colleges often compete for the same students. It also shows that part of the enrollment growth at for-profit colleges is a consequence of declining access in the public sector. Students turn to for-profits when community colleges are unable to meet their educational needs.

The question of whether a prospective student has a choice between a for-profit and a public institution affects judgments about the relative costs and benefits of enrollment in for-profit institutions. In our earlier work, we compared outcomes of students among for-profits, community colleges, and four-year public and nonprofit schools.⁴³ Our finding that students who attended for-profits have more debt and lower employment rates relative to students at the other institutions is not relevant if students lack access to appropriate programs at public colleges. A related point is that for-profit spending on advertising and marketing may well be attracting many students who would otherwise not have attended college at all. When community college is not a viable option, the relevant counterfactual to enrollment at a for-profit institution may be no postsecondary education.

For many people, a for-profit college education endows them with skills that can be put to practice in the labor market immediately

upon program completion. But the high cost of the education to the student and the modest earning opportunities offered by many of the jobs for which these schools prepare students mean that caution is advised. Such caution applies to the students themselves, as well as to taxpayers who foot part of the bill through federal student aid and a much larger part when a student ends up not paying back federal student loans.

What Is the Social Value of For-Profit Education?

Postsecondary education is financed by students and taxpayers. At public institutions, the tuition and fees paid by students are often a small fraction of the cost of providing education. State, federal, and (sometimes even) local governments pay most of the balance of the bill, often in complicated ways. Like federal Title IV aid, state appropriations for public institutions are tied to enrollment, albeit less directly.⁴⁴

These state subsidies help community colleges keep tuition sufficiently low that students have relatively small average federal loan allocations. Average tuition of first-time undergraduates at community colleges in 2008 was only \$1,153, compared with \$10,168 at for-profit institutions.⁴⁵ Only about 13 percent of community college students borrowed money to attend school, compared with more than 90 percent of students in for-profits.⁴⁶ Students at community colleges and some other public institutions rely less on Pell Grants and government loans precisely because the public has already subsidized their schooling.

According to a position paper issued in 2010 by the Apollo Group, the corporation that owns and operates the University of Phoenix, for-profit colleges are a bargain for taxpayers

because they cost the public “significantly less than traditional schools.”⁴⁷ The report calculated the per-student taxpayer cost of a for-profit education as \$4,519, compared with \$11,340 for public two- and four-year institutions. The calculation included federal, state, and local government support, as well as the cost to taxpayers of loan defaults and taxes paid back on corporate profits.⁴⁸

In a similar vein, Stephanie Cellini compared the costs to taxpayers and students of attending a community college as opposed to a two-year for-profit institution.⁴⁹ She estimated an annual per student cost to the taxpayer of \$11,387 at a community college compared with \$7,637 at a for-profit. In both analyses, community colleges were more costly for taxpayers. But tuition and fees at for-profits cost the student, on average, nearly \$20,000 more than they did at community colleges, making the total cost of education about \$15,000 higher at a for-profit institution.

Based on these figures, Cellini estimated the “break even” social and private rates of return on investment to be 9.8 percent and 8.5 percent, respectively, at for-profits, compared with 7.2 percent and 5.3 percent at community colleges. This calculation implies that, relative to community colleges, for-profits need to generate returns that are 36 percent greater for society and 60 percent greater for individuals to be worth the cost. The relatively sparse literature on the subject has found results ranging from no significant difference in returns between the two sectors to lower relative returns among students at for-profits, suggesting that the benefits to society of for-profits do not likely outweigh the costs.⁵⁰

Moreover, these comparisons of social returns do not consider any public goods

benefits of postsecondary institutions, such as research spillovers, the public use of facilities, and the civic benefits of liberal arts education. Studies of economic spillovers find substantial benefits to localities from the presence of flagship public universities and university research more generally.⁵¹ The missions of public institutions (in particular, four-year colleges and universities) often explicitly include the provision of public goods and research and extension services for local industries, whereas for-profits (even those offering bachelors' and higher degrees) explicitly tout that their faculty focus is only on teaching.⁵²

Regulation of the For-Profit Sector

Federal regulations that govern for-profit colleges are intended to ensure that taxpayer money distributed to them is spent wisely. Thus, regulation should be designed to provide incentives to institutions to maximize the social value of the education they provide.

The federal regulations affecting for-profits concern institutional eligibility for federal (mainly Title IV) student financial aid, student outcomes for Title IV–eligible institutions, and the delivery of federal financial aid to students. The 90/10 rule tries to ensure that for-profit institutions are no more than 90 percent dependent on Title IV federal student aid as a share of their total revenues. Federally monitored student outcomes include default rates on federal student loans and, subject to ongoing judicial scrutiny, a broader range of student economic outcomes embodied in a new “gainful employment” regulation. Federal regulations also try to ensure transparency in the presentation of financial aid packages, limit the use of incentives for employees involved in student recruitment, and improve the availability of information on student graduation rates and economic outcomes.

The 90/10 Rule

Federal student financial aid is the lifeblood of for-profit higher education in the United States. Federal grants and loans accounted for 73.7 percent of the revenues of Title IV–eligible for-profit higher education institutions in 2008–09.⁵³ And these figures understate the importance of federal student aid because they do not include military educational benefits.⁵⁴ For-profit schools can acquire no more than 90 percent of their revenue from Title IV sources to maintain their eligibility for that aid, and the constraint comes close to binding for many for-profits, especially some of the large chains. The availability of federal student aid may contribute directly to increases in tuition prices, a conjecture known as the “Bennett hypothesis.” A recent study by Stephanie Cellini and Claudia Goldin found that tuition for certificate programs in Title IV–eligible for-profits was 75 percent higher than in comparable institutions where students cannot apply for federal financial aid.⁵⁵ Related work by Cellini found that increases in the generosity of Pell Grants and other forms of student aid led to increased market entry by for-profit institutions.⁵⁶

Cohort default rates

Federal regulations concerning the eligibility of institutions for Title IV financial aid also try to ensure that postsecondary programs provide marketable skills and do not overburden students with financial debt. To this end, the U.S. Department of Education monitors the default rates of entering cohorts of students by institution. The cohort default rate is defined as the share of borrowers at each school who enter into repayment on federal loans during a twelve-month period and subsequently default in the next two (or three) years. Institutions with a two-year cohort default rate that exceeds 40 percent

in one year, or 25 percent for three consecutive years, lose their eligibility for Title IV aid for one to three years.⁵⁷ The sanctioning of schools with high default rates applies to all institutions that accept Title IV money, including for-profits, community colleges, and four-year universities of all types.

Implemented beginning in the late 1980s, cohort default rate regulation led to the closing of many trade schools in the early 1990s when they were unable to retain Title IV eligibility. The official cohort default rate for all types of institutions fell from a high of 22.4 percent in 1990 to 11.6 percent in 1993 and continued downward to a low of 4.5 percent in 2003, with some of the decline probably attributable to a strengthening economy over the same period.⁵⁸ There were concerns, however, that the low two-year default rate masked high rates of default in the third and subsequent years, as well as a rapid rise in loan deferments and forbearances.⁵⁹ To address the perceived inadequacy of the cohort default rate definition, the Higher Education Opportunity Act of 2008 expanded the default rate window to three years starting with the 2012 cohort.⁶⁰

The Department of Education released trial three-year cohort default rates by institution for the years 2005 to 2008 (covering defaults from 2008 to 2011) to estimate the impact of the new regulation. For the 2008 cohort, lengthening the window from two to three years nearly doubled the default rate (from 7.0 to 13.8 percent), and the increase was particularly striking among for-profit colleges (11.6 to 25.0 percent). If the new regulations had been applied to the 2005–08 period, the number of schools facing a loss of Title IV eligibility would have increased more than tenfold (from 23 to 270). Furthermore, the share of sanctioned schools classified as

proprietary institutions would have increased from 48 percent to 80 percent.⁶¹

The cohort default rate is primarily a measure of the cost of Title IV loans to taxpayers. Cellini estimated that loan defaults accounted for 36 percent of the total cost of for-profit education to taxpayers.⁶² Loan defaults are also an indirect indicator of student outcomes after graduation. It is difficult to repay a loan when you are unemployed. Still, students could struggle under the weight of loan repayments without ever formally defaulting. More generally, the cohort default rate does not explicitly link the costs of postsecondary enrollment to the benefits. For example, a community college could have low loan default rates because of low tuition but also might place very few students in good jobs. The limitations of the cohort default rate measure as well as the problems in recruitment activities by for-profits documented by GAO helped motivate the more encompassing gainful employment regulations.

Gainful Employment

Unlike the cohort default rate regulation, the gainful employment regulation recently adopted by the U.S. Department of Education (formally known as the Gainful Employment-Debt Measures) is targeted specifically at for-profit postsecondary institutions.⁶³ Under the regulation, a program is considered to lead to gainful employment if at least 35 percent of the students in each cohort are in repayment of their federal loans or if the annual loan payment for a typical student is 12 percent or less of annual earnings or 30 percent or less of discretionary income.⁶⁴ A program that fails all three measures for three of four fiscal years would lose Title IV eligibility, which means students in the program would no longer be eligible for Pell Grants and federal student loans. The

regulation applies to all programs at for-profit institutions but only to certificate programs at public and nonprofit institutions.

According to the Higher Education Act of 1965, federal Title IV aid can be used either by students in accredited bachelor's or associates degree programs, or at "any school that provides not less than a 1-year program of training to prepare students for gainful employment in a recognized occupation." This statutory language provides a justification for the department's focus on particular institutions and programs and on outcome-based measures of success in the gainful employment regulation.

The regulation is an important departure from the existing regulatory framework in at least two ways. First, it targets individual programs within institutions. The Education Department's concern with the existing regulatory framework was that the cohort default rate, by averaging across programs within institutions, did not provide students with a good measure of the likely career prospects of individual programs. The second, and more significant, departure is its explicit link between the costs (both to students and taxpayers) and the benefits of higher education, at least as they are reflected in earnings. The regulation also tries to make available more transparent information on student program completion rates and economic outcomes to prospective students.

The future of the gainful employment regulation is uncertain. At the time of this writing, a federal district court hearing a lawsuit by the Association of Private Sector Colleges and Universities had ruled that the Department of Education failed to provide sufficient evidence to justify the loan repayment standard. The judge held that while

the debt-to-income standards were based on objective criteria and research, the justification for a 35 percent repayment rate was based only on the fact that this rate identifies the bottom quarter of schools.⁶⁵ Because the debt-to-income and repayment standards are designed to work together, the court decided that they could not be separated and thus vacated the entire ruling. As of mid-July 2012, department officials had released only a brief statement that they were "reviewing our legal and policy options."⁶⁶

For the 2008 cohort, lengthening the window from two to three years nearly doubled the default rate (from 7.0 to 13.8 percent), and the increase was particularly striking among for-profit colleges (11.6 to 25.0 percent). If the new regulations had been applied to the 2005–08 period, the number of schools facing a loss of Title IV eligibility would have increased more than tenfold (from 23 to 270).

The ruling came just a few days after the department released its first round of trial data collection related to the gainful employment regulation. According to data

Table 2. Share of Programs that Fail Gainful Employment Standards (Percentage except where indicated)

Category	Overall	Public or nonprofit	For-profit, independent	For-profit, chain
All programs				
Failed all three standards	1.4	0.0	1.0	4.2
Failed annual earnings	2.7	0.0	3.2	6.5
Failed discretionary earnings	14.4	0.7	21.2	29.1
Failed repayment rate	10.9	1.0	12.3	25.7
Number of programs	13,772	5,893	4,380	3,499
Programs with more than thirty graduates				
Failed all three standards	5.2	0.0	3.1	7.9
Failed annual earnings	10.0	0.5	9.4	12.4
Failed discretionary earnings	53.8	11.0	62.1	55.5
Failed repayment rate	40.5	15.9	36.2	48.9
Number of programs	3,696	364	1,495	1,837

Source: U.S. Department of Education Federal Student Aid Data Center.

Note: These data report the performance of the institutions' 2011 graduates on the three gainful employment standards and are published for informational purposes only since the regulation does not apply to this cohort of students. The annual earnings standard requires the average annual loan payment for a cohort of students from a program not exceed 12 percent of annual earnings. The discretionary earnings standard analogously requires that the average annual loan payment not exceed 30 percent of discretionary earnings. The repayment rate standard requires that at least 35 percent of students are in repayment of their federal loans. All programs at for-profit institutions, but only certificate programs at public and private nonprofit institutions, are covered by the gainful employment regulation and included in the tabulations. The top panel includes all programs (including those with thirty or fewer students) in the tabulations and shows the share of all eligible programs that would fail each standard under the assumption that no programs with thirty or fewer graduates are counted as failing. The bottom panel shows failure rates only among programs that have more than thirty graduates. The department did not report data on at least one of the three measures for nearly 75 percent of programs because it restricts calculations to programs with more than thirty students in the relevant cohorts. The programs with missing data are small and not representative of the experience of the average student. Because enrollment data was not reported for individual programs, we could not weight the calculations by enrollment.

from students enrolled in 2011, 193 programs at ninety-three different postsecondary institutions—1.4 percent of all programs and 5.2 percent of programs with more than thirty graduates—would have failed to meet all three standards.⁶⁷ Table 2 shows the share of programs by type of institution that would have failed each gainful employment standard. In accordance with the regulations, all programs at for-profit institutions, but only certificate programs at public and nonprofit institutions, are included in the tabulations in table 2.

Had the court upheld only the two debt-to-income standards, the failure rate would rise from 1.4 percent to 2.6 percent overall and from 5.2 percent to 9.6 percent among larger programs. Of the three standards, the annual earnings standard is by far the easiest to meet. Only 2.7 percent of all programs and 10 percent of larger programs have graduates with an average annual loan payment exceeding 12 percent of annual earnings. In contrast, the failure rates for the other two standards are much higher. Among programs with more than thirty

graduates, 53.8 percent would fail the discretionary income standard and 40.5 percent would fail the loan repayment standard. Of programs that fail the annual income standard, 95 percent also fail the discretionary earnings standard. Thus a regulation based only on the annual earnings standard would be far simpler to administer but would have an impact similar to the currently contested gainful employment standard.

The for-profit chains have the highest failure rate for the gainful employment trial standards. We define a chain as having campus branches in at least two census divisions or as operating primarily online.⁶⁸ Nearly 8 percent of programs in chains with thirty or more graduates would have failed to meet the standards, compared with about 3 percent among independent for-profit institutions. The biggest difference comes in the loan repayment rate standard: 49 percent of larger for-profit chains would have failed compared with 36 percent of independents. Higher rates of failure for chain for-profits hold equally within major categories of programs such as health professions, business, and information technology.⁶⁹ Programs with particularly high rates of failure include graphic design and visual arts and law enforcement and security.

The experience of the new cohort default rate regulation in the early 1990s suggests that, if and when the gainful employment regulations go into effect, they will result in some of the worst offenders being shut down, but the remaining for-profit institutions are likely to adjust quickly to the regulations. Recent evidence from the financial disclosures of publicly traded for-profits suggests that the sector may already have been affected by public scrutiny. After growth of 15 to 25 percent from 2007 to June 2010 (around the time that the GAO report and the gainful employment

proposed rule were released), enrollment in thirteen large for-profits began to shrink in late 2010. By March 2011, new enrollments were down by 18 percent.⁷⁰ In its 2011 annual report, the University of Phoenix reported that enrollment among new degree-seekers was down by more than 40 percent.

If it stands, the gainful employment regulation is likely to accelerate the increasing movement of for-profit institutions, particularly large national chains and online institutions, into offering bachelor's and advanced degree programs that cater to students better able to repay federal student loans. Because longer programs entail more Title IV aid, for-profits already had a strong incentive to develop these programs. For-profits have more than quadrupled their share of bachelor's degrees granted, from 1.6 percent in 1999–2000 to 6.7 percent in 2010–11.⁷¹ An analysis by J. P. Morgan that considers the impact of the gainful employment regulation on the sector repeatedly mentions “high exposure to bachelor's degrees” as a positive factor for the stock price of publicly traded for-profits.⁷²

Looking Ahead

We draw three main conclusions from our overview of the for-profit sector and its role in educating disadvantaged students. First, although community colleges may provide an equal or better education at lower cost, demand for higher education is likely to outpace state funding in the near term, and many students who attend for-profits are not academically strong enough to attend a selective institution. Thus the relevant comparison of costs and benefits for individuals who attend a for-profit institution will often be no postsecondary credential at all. In this sense the gainful employment regulation, which attempts to estimate whether a program

provides good value to students who enroll, seems appropriate in principle.

Second, for-profit colleges seem to be at their best with short, well-defined programs that offer a clear path toward a particular occupation. Such programs are also potentially easier to regulate because their objective is clear. Expanding the reach of the gainful employment standard to apply, for example, to recipients of an associate's degree in liberal arts at public community colleges would be more difficult to justify because personal exploration and the option value of future education are essential features of the program. In that case, low costs and low measurable benefits in terms of postgraduate earnings make more sense. In contrast, the student who graduates from a high-tuition for-profit college with substantial debt and who does not find steady employment at a reasonable wage will quickly encounter financial difficulties, and there is less of a case that such an education has the broad social benefits of liberal arts programs.

Finally, the relatively poor performance in terms of completion rates, default rates, and labor market outcomes of those attending for-profits among seekers of bachelor's degrees is troubling because the sector seems to be heading in that direction. Large national chain for-profits have a relatively greater share of their enrollment in bachelor's degree programs than other for-profits, and among all for-profits, the rate of growth in enrollments and degrees awarded in bachelor's and advanced degree programs has been much greater than that for associate's degree and certificate programs. Because tuition in bachelor's degree programs is higher and students enroll for more years, the federal government's per-student commitment of taxpayer money is several times

greater than for a one-year certificate program. In principle, greater taxpayer commitment should be accompanied by increased scrutiny concerning whether students complete the program and make sufficiently high earnings to justify the investment and pay back their student loans. Yet much of the education production process in bachelor's degree programs is a black box, even for (perhaps especially for) more selective four-year institutions. The set of skills one gains with a bachelor's are varied, as are the set of potential occupations in which one can be employed. The variety of goals and outcomes presents a challenge for regulation.

When students vary greatly in their goals and projected benefits of education, a "one size fits all" regulation for a degree program becomes difficult to manage. One possible solution is to strengthen disclosure requirements.⁷³ If potential students could view costs and expected benefits of a program in a simple and standardized format, they could make better decisions, and the government would not have to impose a uniform standard of value. Even better, requiring counseling by an independent third party to make sure prospective students understand financial aid packages and student loan obligations could mitigate the incentives faced by many recruiters at for-profits.

The for-profit sector plays, and is likely to continue to play, an important role in U.S. higher education in an era of public-sector fiscal constraints. A key challenge in regulating for-profit colleges is to restrain overly aggressive and potentially misleading recruitment practices while not stifling educational innovation and improved postsecondary learning opportunities for disadvantaged students.

Endnotes

1. Daniel L. Bennett, Adam R. Lucchesi, and Richard K. Vedder, “For Profit Higher Education: Growth, Innovation, and Regulation,” policy paper (Washington: Center for College Affordability and Productivity, 2010).
2. Title IV eligibility allows institutions to administer federal student aid, primarily in the form of Pell Grants and Stafford Loans. The discussion and analysis in this paper excludes for-profit schools that are not Title IV eligible; little is known about these schools because the U.S. Department of Education does not track them. Virtually all degrees are granted by Title IV–eligible institutions, but programs that are less than two years in length that grant certificates (also diplomas) often are found at non–Title IV institutions. For an analysis of the importance of the non–Title IV group of for-profit schools using state registration data, see Stephanie R. Cellini and Claudia Goldin, “Does Federal Student Aid Raise Tuition? New Evidence on For-Profit Colleges,” Working Paper 17827 (Cambridge, Mass.: National Bureau of Economic Research, February 2012).
3. We define a “chain” as having campus branches in at least two census divisions or as being located primarily online. In constructing our definition of a “chain” for-profit, we follow David J. Deming, Claudia Goldin, and Lawrence F. Katz, “The For-Profit Postsecondary School Sector: Nimble Critters or Agile Predators?” *Journal of Economic Perspectives* 26, no. 1 (2012): 139–74, and combine “regional” and “national” chains into a single category. We classify institutions as “online” based on the institution’s name and the distribution of students across U.S. states.
4. Deming, Goldin, and Katz, “The For-Profit Postsecondary School Sector” (see note 3).
5. Bennett, Lucchesi, and Vedder, “For Profit Higher Education” (see note 1).
6. Sandy Baum and Kathleen Payea, “Trends in Student Aid 2011” (New York: College Board, 2011). Most of the increase in Pell Grants occurred in 2009 and 2010, with the American Recovery and Reinvestment Act of 2009 increasing annual Pell Grant appropriations by more than \$15 billion in 2009. The increase in Stafford Loan volume since 2000 has been much larger for unsubsidized than for subsidized loans.
7. Authors’ calculations using the Grapevine survey of state tax support for higher education. Grapevine, *Historical Data*, edited by Jim Palmer (Normal, Ill.: Illinois State University, Center for the Study of Education Policy, years 2000 to 2010) (<http://grapevine.illinoisstate.edu/historical/index.htm>).
8. Deming, Goldin, and Katz, “The For-Profit Postsecondary School Sector” (see note 3).
9. Of the 5.265 million increase in fall enrollments in Title IV institutions from 2000 to 2009, for-profits accounted for 1.566 million, or 29.7 percent. Of the 1.318 million increase in degrees and certificates awarded by Title IV institutions from 2000–01 to 2009–10, for-profits accounted for 438,000, or 33.2 percent. See U.S. Department of Education, National Center for Education Statistics, *Digest of Education Statistics, 2002*, table 170; 2011, table 196.
10. Guilbert Hentsche, “Innovations in Business Models and Organizational Cultures: The For-Profit Sector,” paper presented to the American Enterprise Institute conference “Reinventing the American University: The Promise of Innovation in Higher Education” (Washington: June 3, 2010).
11. U.S. Government Accountability Office, “Undercover Testing Finds Colleges Encouraged Fraud and Engaged in Deceptive and Questionable Marketing Practices,” testimony before the Committee on Health, Education, Labor, and Pensions, U.S. Senate, Washington, August 4, 2010 (www.gao.gov/new.items/d10948t.pdf).
12. Deming, Goldin, and Katz, “The For-Profit Postsecondary School Sector,” table 1 (see note 3)
13. *Ibid.*

14. National Center for Education Statistics, “2004/09 Beginning Postsecondary Students Longitudinal Study (BPS: 04/09),” NCES 2012-246 (U.S. Department of Education, 2011). Figures are weighted to be nationally representative of first-time, full-year undergraduates in fall 2003 in for-profits, community colleges, and nonselective four-year public and nonprofit institutions. Nonselective four-year institutions are defined by the BPS as either explicitly open admission or in the bottom 15 percent of median SAT/ACT scores and in the bottom 15 percent of the share of applicants denied admission.
15. For the definition of “selective” and “nonselective,” see table 1.
16. This definition of loan default in the BPS is different from the regulatory standard established by the U.S. Department of Education, which measures an institution’s “three-year cohort default rate” as the share of borrowers at each school who enter into repayment on federal loans during a twelve-month period and subsequently default in the next three years. Because a shorter window leads to lower counts, the official 2009 three-year cohort default rate among proprietary schools of 22.7 percent implies that for-profit students in the BPS data have lower default rates than the 2009 national average. That is likely due to some combination of worsening economic conditions and differences between the BPS sample and the overall population of students at for-profits.
17. Some students switch into different types of award programs (moving, say, from a certificate to an associate’s program) within the same institution during their first semester. In all of our results, we classify students by their initial self-reported plans to seek each type of award in the fall of 2003, rather than by the program in which they are enrolled at the end of the semester.
18. For further information, see tables 2 and 3 and appendix tables 2 through 5 in Deming, Goldin, and Katz, “The For-Profit Postsecondary School Sector?” (see note 3).
19. Arthur Keiser, “Private Sector Schools Could Boost Employment,” *Daily Caller*, July 20, 2011 (<http://dailycaller.com/2011/07/20/private-sector-schools-could-boost-employment/>). Keiser is the chairman of the Association of Private Sector Colleges and Universities.
20. Deming, Goldin, and Katz, “The For-Profit Postsecondary School Sector” (see note 3).
21. Kevin Lang and Russell Weinstein, “Evaluating Student Outcomes at For-Profit Colleges,” Working Paper 18201 (Cambridge, Mass.: National Bureau of Economic Research, June 2012).
22. Nicholas Turner, “Do Students Profit from For-Profit Education? Estimating the Returns to Postsecondary Education with Tax Data” (U.S. Department of the Treasury, 2011).
23. Stephanie R. Cellini and Latika Chaudhary, “The Labor Market Returns to a Private Two-Year College Education” (George Washington University, 2011).
24. Data are from Deming, Goldin, and Katz, “The For-Profit Postsecondary School Sector” (see note 3).
25. Sarah E. Turner, “For-Profit Colleges in the Context of the Market for Higher Education,” in *Earnings from Learning: The Rise of For-Profit Universities*, edited by David W. Breneman, Brian Pusser, and Sarah E. Turner (State University of New York Press, 2006), pp. 51–70.
26. U.S. Department of Labor, Bureau of Labor Statistics, “Occupational Outlook Handbook 2011–2012” (www.bls.gov/ooh/home.htm).
27. James E. Rosenbaum, Regina Deil-Amen, and Ann E. Person, *After Admission: From College Access to College Success* (New York: Russell Sage Foundation, 2006).
28. Ibid.
29. Abby Goodnough, “New Meaning for Night Class at 2-Year Colleges,” *New York Times*, October 29, 2009 (www.nytimes.com/2009/10/28/education/28community.html).

30. Pearson Foundation, *Second Annual Pearson Foundation Community College Student Survey* (Washington: 2011).
31. Ibid.
32. For a more detailed discussion of the research on remediation in higher education, see Eric Bettinger, Angela Boatman, and Bridget Terry Long, “Student Supports: Developmental Education and Other Academic Programs,” *Future of Children* 23, no. 1 (2013).
33. David Moltz, “California Calamity,” *Inside Higher Ed* (www.insidehighered.com/news/2009/05/21/california).
34. David Moltz, “California’s Deal with Kaplan,” *Inside Higher Ed* (www.insidehighered.com/news/2010/05/26/kaplan).
35. Kaplan University, “Kaplan University Launches Multi-Million Dollar California Commitment and Experiential Learning Scholarships,” Press Center (http://portal.kaplan.edu/PageTemplates/PressRelease_KHEBrand.aspx?id=13677).
36. Stephanie R. Cellini, “Crowded Colleges and College Crowd-Out: The Impact of Public Subsidies on the Two-Year College Market,” *American Economic Journal: Economic Policy* 1, no. 2 (August 2009): 1–30.
37. Federal Register, “Revision to Section 668.14(b)(22) of the Higher Education Act of 1965” (November 1, 2002), pp. 67072.
38. U.S. Government Accountability Office, “Undercover Testing Finds Colleges Encouraged Fraud” (see note 11).
39. Andrew Steiner, Jeffrey Volshteyn, and Molly McGarrett, “Education Services Data Book” (New York: J.P. Morgan North American Equity Research, Business and Education Services, 2011).
40. U.S. Department of Education, *Federal Student Aid* (<http://federalstudentaid.ed.gov/datacenter/proprietary.html>).
41. Kevin M. Stange, “An Empirical Investigation of the Option Value of College Enrollment,” *American Economic Journal: Applied Economics* 4, no. 1 (2012): 49–84.
42. U.S. Government Accountability Office, “Undercover Testing Finds Colleges Encouraged Fraud” (see note 11).
43. Deming, Goldin, and Katz, “The For-Profit Postsecondary School Sector” (see note 3).
44. For example, in many states, such as Texas, a sizable share of community college funding also comes from local property tax revenues, either at the county level or through the establishment of community college taxing districts. In Florida, on the other hand, all public funding of community colleges comes from a block grant provided by the state. See Donald C. Hudson, *A Policy Analysis of Community College Funding in Texas*, doctoral dissertation, University of Texas at Austin (2008); and David Moltz, “For Florida Community Colleges, Who Should Pay?” *Inside Higher Ed* (www.insidehighered.com/news/2008/09/19/florida).
45. National Center for Education Statistics, *National Postsecondary Student Aid Study 2008* (U.S. Department of Education, 2008) (<http://nces.ed.gov/datalab/>).
46. Ibid.
47. Apollo Group, Inc, “Higher Education at a Crossroads,” position paper (Phoenix: 2010).

48. The estimated costs to taxpayers depend on assumptions about defaults and recovery rates on federal student loans across sectors. The Apollo Group uses a default rate of 39.5 percent for the for-profit sector based on a weighted average of the Department of Education's published lifetime default rates for two- and four-year institutions. They assume a loan recovery rate of 60.6 percent, which effectively reduces the cost of default by 60 percent. However, there is little data available on recovery rates. Cellini, "Crowded Colleges and College Crowd-Out" (see note 36) uses a recovery rate of 10 percent. If this rate were applied to the Apollo Group's calculation, the cost to taxpayers would rise from \$4,519 to \$5,487 for for-profits and from \$11,340 to \$11,596 for public institutions.
49. Stephanie R. Cellini, "For-Profit Higher Education: An Assessment of Costs and Benefits," *National Tax Journal* 65, no. 1 (March 2012): 153–80.
50. Cellini and Chaudhary, "The Labor Market Returns to a Private Two-Year College Education" (see note 23); Deming, Goldin, and Katz, "The For-Profit Postsecondary School Sector" (see note 3); Lang and Weinstein, "Evaluating Student Outcomes at For-Profit Colleges" (see note 21); Turner, "Do Students Profit from For-Profit Education?" (see note 22).
51. Adam Jaffe, "Real Effects of Academic Research," *American Economic Review* 79, no. 5 (December 1989): 957–70; Enrico Moretti, "Estimating the Social Return to Higher Education," *Journal of Econometrics* 121, no. 1–2 (2004): 175–212.
52. Claudia Goldin and Lawrence F. Katz, "The Shaping of Higher Education: The Formative Years in the United States, 1890 to 1940," *Journal of Economic Perspectives* 13, no. 1 (Winter 1999): 37–62.
53. Authors' calculations based on the data from U.S. Department of Education, Federal Student Aid Data Center (<http://federalstudentaid.ed.gov/datacenter/>).
54. Military educational benefits do not count toward the 90 percent federal Title IV student aid revenues under the 90/10 rule. The for-profits have, in consequence, actively recruited military benefit recipients (veterans, service members, and their family members), especially under the generous Post-9/11 GI Bill enacted in 2008. For-profits accounted for 36.5 percent of the Post-9/11 GI Bill benefits during the first year of the program and 50 percent of the Department of Defense Tuition Assistance benefits in FY 2011. See U.S. Senate Health, Education, Labor and Pensions Committee, "Department of Defense Data Reveals For-Profit Colleges Are Taking in the Bulk of Military Education Benefits," Press Release (2012) (<http://www.harkin.senate.gov/documents/pdf/4f468d002ae0a.pdf>).
55. Cellini and Goldin, "Does Federal Student Aid Raise Tuition?" (see note 2).
56. Stephanie R. Cellini, "Financial Aid and For-Profit Colleges: Does Aid Encourage Entry?" *Journal of Policy Analysis and Management* 29, no. 3 (Summer 2010), 526–52.
57. National Archives and Records Administration, "Amendments to the Higher Education Act, 34 CFR 668.187(a)," *Electronic Code of Federal Regulations* (<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&rgn=div5&view=text&node=34:3.1.3.1.34&idno=34>).
58. In addition, an amendment to the Higher Education Act in 1998 lengthened the period of delinquency required to constitute a "default" from 180 to 270 days. This action lowered the default rate mechanically, although much of the drop in defaults happened in the mid-1990s, before this change.
59. U.S. Department of Education, Office of Inspector General, "Audit to Determine if Cohort Default Rates Provide Sufficient Information on Defaults in the Title IV Loan Programs," Final Audit Report (2003). This audit study of cohort default rate methodology found that trends in defaults looked different when a third year was added to the calculation. It also showed that deferments and forbearances rose from 5.2 percent of all borrowers in 1993 to 21.7 percent in 1999. Loans in deferment or forbearance over the life of the cohort default rate window are counted as "nondefaults."

60. To compensate for this change, the threshold of a 25 percent default rate in three consecutive years was raised to 30 percent (but the one-year threshold of 40 percent remained the same).
61. Authors' calculations using federal data on trial three-year cohort default rates: U.S. Department of Education, *Federal Student Aid: Default Rates* (<http://studentaid.ed.gov/about/data-center/student/default>).
62. Cellini, "Financial Aid and For-Profit Colleges" (see note 56).
63. Federal Register, "Program Integrity: Gainful-Employment Debt Measures" (June 13, 2011), pp. 34386–539 (<http://federalregister.gov/a/2011-13905>).
64. Unlike the cohort default rate, in this calculation students with deferments and forbearances do not count as being "in repayment." They must actually repay at least one dollar of their loans to qualify.
65. United States District Court for the District of Columbia, *Association of Private Colleges and Universities v. Arne Duncan and United States Department of Education*, Civil Action 11-1314 (RC) (http://ecf.dcd.uscourts.gov/cgi-bin/show_public_doc?2011cv1314-25).
66. U.S. Department of Education, *Homeroom* blog (July 2, 2012) (www.ed.gov/blog/2012/07/statement-of-the-united-states-department-of-education-in-response-to-the-ruling-of-the-u-s-district-court-for-the-district-of-columbia-in-apsu-v-duncan/).
67. Programs with thirty or fewer students in the 2011 graduating cohort do not report repayment and debt-to-income data. Over time, the regulation will apply to programs with more than thirty graduates over a four-year time period.
68. Deming, Goldin, and Katz, "The For-Profit Postsecondary School Sector" (see note 3)
69. U.S. Department of Education, *Federal Student Aid: 2011 Gainful Employment Informational Rates* (<http://federalstudentaid.ed.gov/datacenter/gainful2.html>). These Department of Education data classify each program by its Classification of Instructional Program (CIP) code, and we separate programs by their major 2-digit CIP code program area.
70. Steinerman, Volshteyn, and McGarrett, "Education Services Data Book" (see note 39).
71. U.S. Department of Education, Institute of Education Sciences, *Postsecondary Institutions and Price of Attendance in 2011–12; Degrees and Other Awards Conferred: 2010–11; and 12-Month Enrollment: 2010–11* (September 2011) (<http://nces.ed.gov/pubs2011/2011250.pdf>).
72. Steinerman, Volshteyn, and McGarrett, "Education Services Data Book" (see note 39).
73. Bridget Terry Long, "Grading Higher Education: Giving Consumers the Information They Need" (Washington: Center for American Progress and the Hamilton Project, 2010). This paper discusses an approach to improving consumer information regarding higher education.

E-Learning in Postsecondary Education

Bradford S. Bell and Jessica E. Federman

Summary

Over the past decade postsecondary education has been moving increasingly from the classroom to online. During the fall 2010 term 31 percent of U.S. college students took at least one online course. The primary reasons for the growth of e-learning in the nation's colleges and universities include the desire of those institutions to generate new revenue streams, improve access, and offer students greater scheduling flexibility. Yet the growth of e-learning has been accompanied by a continuing debate about its effectiveness and by the recognition that a number of barriers impede its widespread adoption in higher education.

Through an extensive research review, Bradford Bell and Jessica Federman examine three key issues in the growing use of e-learning in postsecondary education. The first is whether e-learning is as effective as other delivery methods. The debate about the effectiveness of e-learning, the authors say, has been framed in terms of how it compares with other means of delivering instruction, most often traditional instructor-led classroom instruction. Bell and Federman review a number of meta-analyses and other studies that, taken together, show that e-learning produces outcomes equivalent to other delivery media when instructional conditions are held constant. The second issue is what particular features of e-learning influence its effectiveness. Here the authors move beyond the “does it work” question to examine how different instructional features and supports, such as immersion and interactivity, influence the effectiveness of e-learning programs. They review research that shows how these features can be configured to create e-learning programs that help different types of learners acquire different types of knowledge. In addressing the third issue—the barriers to the adoption of e-learning in postsecondary education—Bell and Federman discuss how concerns about fraud and cheating, uncertainties about the cost of e-learning, and the unique challenges faced by low-income and disadvantaged students have the potential to undermine the adoption of e-learning instruction.

Based on their research review, the authors conclude that e-learning can be an effective means of delivering postsecondary education. They also urge researchers to examine how different aspects of these programs influence their effectiveness and to address the numerous barriers to the adoption of online instruction in higher education.

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Although most student training and development in U.S. colleges and universities continues to take place with teachers and students interacting face-to-face in traditional classrooms, the past decade has witnessed a significant migration of postsecondary education from the classroom to online. A 2011 Babson Survey Research Group poll of more than 2,500 chief academic officers found that 65 percent view online learning as a critical part of their long-term strategy.¹ The survey also revealed that more than 6 million, or 31 percent, of the nation's college students took at least one online course during the fall 2010 term, an increase of more than 560,000, or 10.1 percent, over the previous year. Although this figure is significantly lower than the 21.1 percent annual growth in online enrollment recorded by Babson in fall 2009, it far exceeds the 0.6 percent annual growth in the overall number of higher education students during the same period.

The growth of e-learning in postsecondary education is not limited to online courses and programs but rather covers an expanding array of applications and approaches that use technology in different ways and to varying degrees. These applications include simple videotaped lectures posted on the Internet, as well as learning-management systems, such as Blackboard, that distribute content such as lecture notes, syllabi, and assignments and facilitate peer and student-teacher interaction. They also include more sophisticated online collaborative simulations that create high-fidelity learning environments and interactive e-learning systems that use artificial intelligence to deliver customized instruction to students.² Interest is also growing in making learning accessible to students through mobile devices, such as smartphones and tablets.

There are a variety of reasons for the growth of e-learning in postsecondary institutions, including a need to generate new revenue streams, expand access, offer students greater scheduling flexibility and the freedom to work at their own pace, and curb increasing costs. As e-learning has been expanding, however, so have debates about its effectiveness and concerns about its impact on the quality of higher education. According to Babson, for example, although two-thirds of the academic leaders polled believe that online education is just as good as or better than face-to-face instruction, the remaining one-third believe the learning outcomes of online courses are inferior to those of face-to-face instruction.³ As might be expected, leaders at institutions that do not offer online courses or programs tend to be more skeptical. A survey of the general public conducted by the Pew Research Center using a nationally representative sample of 2,142 adults found that only 29 percent believe online courses are as valuable educationally as courses taken in the classroom.⁴

In this article we address three key questions about the growth of e-learning in postsecondary education. First, is e-learning as effective as other delivery media? The debate about the effectiveness of e-learning has typically been framed in terms of how it compares with other means of delivering instruction, particularly traditional teacher-led classroom instruction. To examine this question we review research that evaluates the effectiveness of e-learning by comparing learning outcomes across different delivery media. Second, what features of e-learning influence its effectiveness? Exploring this issue requires moving beyond the “does it work” question to a more nuanced consideration of the conditions under which e-learning is likely to be most effective in postsecondary settings. Third and

finally, what are the barriers to the adoption of e-learning in higher education? Before addressing these questions, we define and describe e-learning and review current trends in how it is being used in higher education.

What Is E-Learning?

For researchers, e-learning is a vast and somewhat disconnected area of inquiry that has attracted interest from disciplines as diverse as educational psychology, computer science, information science, management, communications, and more. The breadth of the subject and the divergent objectives among those studying e-learning have led to a fragmented understanding of what e-learning means and how it should be defined. The current state of affairs is perhaps best illustrated by the many terms used to refer to instruction delivered through computer technology—e-learning, online learning, distance learning, distance education, computer-assisted instruction, computer-based instruction, technology-based instruction, technology-delivered instruction, computer-based simulation, and simulation games. In their recent review of e-learning research, Kenneth Brown, Steven Charlier, and Abigail Pierotti identified forty-six distinct terms.⁵ One explanation for this proliferation of terms is that the seemingly endless combinations and variants of technologies create different e-learning applications with very different capabilities. Another is the constantly evolving nature of e-learning, with new terms accompanying the introduction of new e-learning technologies or applications. Further complicating matters, e-learning can be used either as a stand-alone delivery tool or as a supplement to face-to-face instruction (the latter commonly known as “hybrid” or “blended” learning). As William Bowen and several colleagues suggest, “‘online learning’ is hardly one thing. It comes in a dizzying variety of flavors.”⁶

The challenge for those seeking to make sense of this field is that these terms are often applied inconsistently. For example, the terms “e-learning” and “online learning” are frequently used to refer to instruction in which most (often 80 percent or more) of the content is delivered through networked technology (such as the Internet), although the same terms have also been used to refer to programs delivered through non-networked digital technologies (for example, CD or DVD). Further, some analysts distinguish between specific delivery media, such as “online learning,” and broad approaches to instruction, such as “distance education,” whereas others use these terms interchangeably. Such inconsistent use of terms can make it difficult to determine the equivalency of courses or programs examined across studies. Accordingly, our view is that it matters less what specific label or term analysts use for a particular learning program than that they provide clear and detailed information about the technological and instructional features embedded in it. That is, it is important for investigators to describe the defining features of the e-learning programs they examine so findings across different studies can be appropriately aggregated and compared. In reality, however, authors commonly neglect to report important details about the learning technologies and learner experiences they examine.

We use the umbrella term “e-learning” to refer to all forms of electronically supported instruction. In their review, Brown, Charlier, and Pierotti formally define “e-learning” as “a broad array of applications and processes that share a common feature of relying on some type of computer technology to promote learning.”⁷ That expansive definition fits nicely with our own objective, which is to provide a broad review of technology in

postsecondary education. Another feature common to most postsecondary e-learning is that it relies on the Internet.⁸ As noted, the term “e-learning,” along with “online learning” and “web-based instruction,” usually refers to instruction delivered through network technology. Finally, we use the term “e-learning” because it is commonly used among the general public, as well as by colleges when they refer to their technology-enabled courses or degree programs. For example, a Google search yields about 94 million results for “e-learning,” compared with 33 million for “distance learning” and 20 million for “online learning.” Although we use this broad term throughout the article, we are careful to note when particular findings or conclusions are confined to a specific type of technology.

Current Trends in Postsecondary E-Learning

Institutions of higher education are putting much thought into how they might optimize their course enrollment and attract new students by delivering instruction through e-learning applications. Among the most active participants in the college e-learning market are large state systems such as the University of Maryland University College (UMUC), Pennsylvania State University, and the University of Massachusetts (UMassOnLine). In 2011, more than 70,000 students worldwide enrolled in at least one online UMUC course and the university had more than 230,000 enrollments in online-only courses. UMUC, which has been educating students in Europe since 1949 and in Asia since 1956, claims to be the largest four-year public university in the United States and the largest public provider of higher education to working professionals and to U.S. military personnel and their family members.

For-profit universities are also a growing part of the online college market. The University of Phoenix (UP), which describes itself as the largest private university in North America, enrolled more than 380,000 students in degree programs in 2011. In its more than 100 degree programs at the associate’s through the doctoral level, students can attend class online, in a traditional classroom, or a combination of both. Its 2011 *Annual Academic Report* noted that 2.2 percent of its students are nonresident aliens, 18.4 percent are black, 36.3 percent are white, and 68.9 percent are female. More than half of the graduate student body consists of minority students.⁹ As of September 2010, Kaplan University offered ninety-six academic programs, including fifty-nine degree programs (associate’s, bachelor’s, and graduate), two diploma programs, thirty-two certificate programs, and three law-related degrees through distance, blended online, and on-campus learning. According to Kaplan’s 2010 annual report, of the more than 68,000 students enrolled during 2009–10, 75 percent were women and 55 percent were over the age of thirty.¹⁰ Other prominent for-profit institutions include Laureate International Universities, which enrolls students from more than 120 countries in bachelor’s, master’s, and doctoral programs, and Strayer University, which offers associate’s, bachelor’s, and master’s degrees in a variety of areas, including business administration, accounting, and information technology. The article by David Deming, Claudia Goldin, and Lawrence Katz in this issue examines for-profit colleges in detail.¹¹

Over the past decade, the number of students enrolling in e-learning courses at these and other postsecondary institutions has grown dramatically. The National Center for Education Statistics estimates that between

2000 and 2008 the share of undergraduates enrolled in at least one online course grew from 8 percent to 20 percent.¹² As noted, the Babson Survey Research Group estimated that by the fall of 2010, 31 percent of all higher education students were taking at least one online course.¹³ Further, Babson estimated that between 2002 and 2010 online enrollments grew at a rate of 18.3 percent, compared with just more than 2 percent for the overall postsecondary education student body. A 2011 Pew Research Center survey of more than 1,000 U.S. colleges and universities found that 82 percent of community colleges offer online courses, compared with 79 percent of research universities and 61 percent of liberal arts colleges.¹⁴ It also found that 91 percent of two-year colleges offered online classes, compared with 89 percent of four-year public colleges and universities and 60 percent of private colleges and universities.

The National Center for Education Statistics estimates that between 2000 and 2008 the share of undergraduates enrolled in at least one online course grew from 8 percent to 20 percent.

According to a 2011 survey conducted by the Instructional Technology Council, the share of students taking online classes at community colleges is split almost equally between traditional students aged eighteen through twenty-five (48 percent) and nontraditional students twenty-six and over (47 percent).¹⁵

Some 62 percent of online students are female; 37 percent, male. Although online courses and degrees are offered in a wide array of subject areas, the online-only bachelor's degree major that enrolls the most students is criminal justice. As estimated by the firm Eduventures, 27 percent of all online-only enrollments are in criminal justice, followed by 19 percent in computer and information technology, 16 percent in health care, and 14 percent in business.¹⁶ Online enrollments are estimated to be growing most rapidly in fields related to health care.¹⁷

Is E-Learning as Effective as Other Delivery Media?

Even as online enrollment continues to grow, concerns remain about the legitimacy and value of e-learning in postsecondary education. The debate about the effectiveness of e-learning has historically been cast in terms of how electronic delivery of instruction compares with other forms of delivery, particularly traditional classroom delivery, which remains the most common form of instruction in higher education. For reasons we discuss later, we do not find studies comparing the effectiveness of different media terribly enlightening. But because this comparison has attracted significant attention not only from academics but also from administrators and the general public, we next provide an overview of academic and public perspectives on the comparative effectiveness of e-learning and other delivery media. We then review empirical evidence on effectiveness and discuss its implications for e-learning in postsecondary settings.

Academic and Public Perspectives on the Effectiveness of E-Learning

Among researchers, views on the relative effectiveness of e-learning and traditional instruction fall into two primary camps.

Richard Clark has argued that there is nothing uniquely advantageous to any delivery medium and that, therefore, a well-designed media comparison study should find no effects.¹⁸ Clark sees technology as a mere tool to be manipulated at the hands of instructional design, pedagogical approaches, and teacher practices. As he puts it, “media only deliver instruction but do not influence learning.”¹⁹ In the same vein, Steven Ross, Gary Morrison, and Deborah Lowther contend that “educational technology is not a homogeneous ‘intervention’ but a broad variety of modalities, tools, and strategies for learning. Its effectiveness, therefore, depends on how well it helps teachers and students achieve the desired instructional goals.”²⁰ In sum, according to this view, e-learning should be no more or less effective than any other form of instructional delivery. As with other types of instruction, e-learning’s effectiveness depends on how well it is designed to create the instructional experience that makes learning possible.

Academic advocates of e-learning, by contrast, cite numerous potential pedagogical benefits, such as customizing instruction to the learner, creating multimedia (text, images, sound, video) information environments, and increasing interactivity.²¹ Because many media tools today have moved beyond simple prerecorded videos and can now offer more interaction between learners and teachers, among learners, and between the learner and the content, some observers argue that different delivery media can offer unique learning support. They contend that in certain situations e-learning can lead to better academic outcomes by creating an instructional experience that is difficult or impossible to create in the classroom or through alternative media.

A third perspective on the effectiveness of e-learning, more prevalent among the general public than among academics, is that the outcomes associated with e-learning courses are inferior to those of traditional, face-to-face instruction. William Bowen and his co-authors cite “concerns that at least some kinds of online learning are low quality and that online learning in general de-personalizes education.”²² As noted, the Pew Research Center reports that a majority of the general public, including young adults who have grown up in a digital world, believes that online courses offer less educational value than traditional classroom courses.²³ Lawrence Bacow and several colleagues also note that many faculty are skeptical of the value of e-learning because it differs from the way in which they were taught and because they fear it will distance them from their students, thereby undermining the educational and mentoring process.²⁴

Empirical Evidence on Effectiveness

Over the past several decades, thousands of studies have examined the effectiveness of e-learning, broadly defined. Much of this work has compared e-learning with traditional classroom instruction and other forms of delivery media. Early research focused primarily on evaluating distance education, such as televised broadcasts and videoconferencing, but over time attention shifted to computer-based instruction and most recently to online instruction as well as computer-based simulations. Proponents of this research argue that a systematic account explaining why and how learning effectiveness differs between different forms of delivery could help policy makers, administrators, researchers, and educational-design specialists determine the equivalency and value of ongoing innovation.²⁵

Over the years, however, e-learning research has been hamstrung by several important methodological limitations. Although these deficiencies are sometimes beyond the control of investigators, they have nonetheless led to questions about the validity of the research findings.²⁶ For example, many studies have used what is called “single group pretest, post-test designs,” which can lead to an upward bias in effect sizes.²⁷ And even in more sophisticated two-group study designs that compare treatment groups with comparison, or control, groups, participants are often not randomly assigned to treatment and control conditions (only in the gold standard, or experimental, study designs are participants assigned randomly). Participants may thus self-select into different instructional conditions, which can allow preexisting differences among them to go unmeasured and lead to bias in observed effects. As a second illustration of methodological limits, some studies, even those with comparison groups, can confound differences in delivery media with differences in instruction.²⁸ In other words, the instruction received by participants in the e-learning condition is often not equivalent to that received by participants in the classroom or comparison condition. In certain forms of e-learning, such as simulations, for example, students may be required to engage more actively than they would in a classroom environment. Because instructional methods that facilitate active engagement enhance learning, differences in achievement may be attributable to differences in activity level rather than in the delivery media *per se*.²⁹ The curriculum materials and the time spent in learning can also differ across the e-learning and comparison groups, thus leading to differences in achievement. In short, because differences in delivery media are often associated with differences in other instructional features, studies that contrast

different delivery media are often not making apples-to-apples comparisons.

A comprehensive review of this vast and diverse research literature is beyond the scope of this article. Instead, we focus on several meta-analyses that have been conducted on e-learning research. Meta-analysis is a technique for combining the results of multiple studies to obtain an overall estimate of a particular effect or relationship. One of the advantages of meta-analysis is that by aggregating the findings of multiple studies it reduces the influence of factors that are idiosyncratic to a specific study. In addition, the meta-analyses that we examine acknowledge the methodological limitations noted above and take steps to try to address them. For example, all of the meta-analyses screened studies to ensure they met a basic level of methodological rigor, such as employing if not an experimental design, at least a quasi-experimental design, in which there is a comparison group that receives a comparable treatment and often an attempt to statistically control for differences between the students engaged in e-learning and those engaged in other forms of learning. Studies that did not meet these minimum standards were excluded from the meta-analyses. Furthermore, each of the meta-analyses recorded methodological and substantive differences across studies, such as whether the curriculum and instruction was equivalent in the treatment and comparison conditions, and examined these differences to see whether they affected the results. Despite these efforts, the studies included in the meta-analyses vary significantly in terms of methodology. And because many studies provide limited information about the nature of instruction in different conditions, it is impossible to account fully for potentially important instructional differences that may

be influencing the findings. For example, in their meta-analysis, Robert Bernard and his co-authors note that the studies of e-learning they reviewed commonly describe thoroughly the e-learning condition, but offer little detail about the comparison condition (classroom instruction).³⁰

These limitations notwithstanding, we believe the meta-analyses provide the most comprehensive assessment of the effectiveness of e-learning relative to other delivery media. We next review the findings of several meta-analyses, emphasizing more recent reviews because they often incorporate studies analyzed in earlier reviews and are also more likely to include studies that examine the effectiveness of modern forms of e-learning such as web-based learning and interactive simulations. In addition, we devote attention to reviews that focus primarily on adult learners because those findings are more likely to generalize to college students.

Results of Meta-Analysis

The meta-analysis conducted by Bernard and his colleagues examined 232 studies (yielding 688 effect sizes) dated from 1985 to 2002 that compared e-learning (which they termed distance education) with traditional, or classroom, instruction on measures of achievement, student attitude, and course completion.³¹ The studies focused on two types of e-learning—asynchronous (mostly correspondence and online courses, in which students participate at different times) and synchronous (mostly teleconferencing and satellite-based delivery, in which all students participate simultaneously)—and included a mixed population of students, including K-12, graduate, and military, although most were undergraduates. Measures of student achievement showed no significant overall difference between e-learning and classroom

instruction. Measures of student attitude showed a small but significant difference, with students generally favoring classroom instruction over e-learning, although they rated only synchronous e-learning significantly lower than they rated classroom instruction. Course completion measures showed a very small but significant overall difference in favor of classroom instruction, though only when compared with asynchronous e-learning. In summary, the meta-analysis revealed no significant overall difference between e-learning and traditional instruction in terms of overall achievement, but more negative student attitudes toward synchronous e-learning and higher dropout rates in asynchronous e-learning.

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A meta-analysis by Traci Sitzmann and several colleagues compared the effectiveness of classroom and web-based instruction, defined as a “hypermedia-based instructional program, which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported.”³² Their

analysis of ninety-six published and unpublished studies involving 19,331 students found that web-based instruction was 6 percent more effective than traditional classroom instruction for teaching declarative knowledge (facts and principles), but not procedural knowledge (rules and procedures) or student reactions. Used as a supplement to classroom instruction (blended learning), web-based instruction was 13 percent more effective than classroom instruction for declarative knowledge and 20 percent more effective for procedural knowledge. These findings, however, should be interpreted with caution because offering web-based instruction as a supplement may lead to more learning time or other important instructional differences relative to the comparison classroom condition. Indeed, the authors found web-based and classroom instruction equally effective for teaching declarative knowledge when the instructional methods used in both were equivalent. They attribute the small overall advantage of web-based instruction to its use of more (and more effective) instructional methods, rather than to the delivery media *per se*.

Another recent meta-analysis, conducted by the U.S. Department of Education, Office of Planning, Evaluation, and Policy Development, examined fifty independent effect sizes from forty-five studies evaluating online learning.³³ Although the meta-analysis was designed to draw conclusions about online learning in the context of K-12 education, only five studies with K-12 students met the inclusion criteria set by the authors. The remaining studies focused on college undergraduates or those in graduate programs or professional training. The findings revealed that students who took a course online did not perform significantly differently than those taking the same course

through traditional face-to-face instruction. Students in courses that combined online and face-to-face instruction (blended learning) had stronger learning outcomes than did those in face-to-face instruction alone. Both instructor-directed and collaborative and interactive online instruction (both fully online and blended) led to stronger outcomes than classroom instruction, but outcomes in independent online learning and face-to-face instruction had no significant difference. Finally, the positive effect of online learning (both fully online and blended) was reduced somewhat when curriculum materials and instructional approach were equivalent across conditions.

In a study published in 2011, Sitzmann used meta-analytic techniques to examine the instructional effectiveness of computer-based simulation games.³⁴ The studies that she analyzed used different kinds of comparison groups, with participants in some receiving no training and those in others receiving alternative instructional methods. To be included in the meta-analysis, a study had to focus on adult learners (aged eighteen or older) and on training that facilitated potentially job-relevant knowledge or skills. The analysis, which covered a total of sixty-five independent samples from fifty-five reports, revealed that trainees in the simulation game group had 11 percent higher declarative knowledge, 14 percent higher procedural knowledge, 9 percent higher retention, and 20 percent higher self-efficacy than trainees in the comparison group. The entertainment value of the simulation did not influence its effectiveness, nor did differences in methodology across studies (for example, studies with and without random assignment). Results did vary, however, by the type of instruction provided to the comparison group and the simulation group. Simulation games were

more effective than lectures, assignments, and readings, but less effective than computerized tutorials. Trainees learned more from simulation games when they had unlimited access to the games (presumably leading to more time spent learning) and when the games were embedded in a program of instruction (blended learning). In fact, when simulation games were the sole instructional method, trainees in the comparison group learned more than those in the simulation game group. Finally, in studies that matched the simulation and comparison groups in terms of the activity level of instruction, learning was similar across conditions. Once again, this finding suggests that the learners in the simulation games condition may have been advantaged not because of the delivery media per se, but rather because they often received more active instruction than those in the comparison group.

Effectiveness of E-Learning: Conclusions

These meta-analytic studies paint a rather complex picture of the effectiveness of e-learning. Overall their findings, as well as the findings of earlier reviews not discussed here, suggest that e-learning is at least as effective as, and in some cases more effective than, classroom instruction. But taking into account various methodological and instructional factors can change the findings—typically not reversing them but rather weakening or eliminating the observed benefits of e-learning. Furthermore, some of the meta-analyses found widely varying effect sizes for the relationship between e-learning and the learning outcomes, with some studies finding e-learning much more effective than classroom instruction and others finding it much less effective. Such variability suggests that other explanations—such as aspects of the instruction, teacher effectiveness, or student characteristics—account

for the relative effectiveness of e-learning in the studies.

Several recent studies that have attempted to address the deficiencies of earlier work in this area have provided a more rigorous evaluation of the effect of e-learning on student achievement. David Figlio, Mark Rush, and Lu Yin, for example, randomly assigned students in a large introductory microeconomics course to either live lectures or online delivery of the recorded lectures.³⁵ The sections differed only in the method of delivery and were identical in all other ways, including the instruction, assignments, and teaching assistant support. Overall, the course exam scores for students in the live instruction and online sections showed no significant difference, although certain students—specifically, Hispanic students, males, and low achievers—performed significantly better in the live instruction section. In a study already noted, William Bowen and his co-authors randomly assigned students in an introductory statistics course conducted at six public universities to either a traditional classroom-based section or a hybrid section.³⁶ In the hybrid section, most of the instruction was delivered through interactive online materials, but students also attended for one hour a week a face-to-face session where they could ask questions and receive assistance. Student learning outcomes in the traditional and hybrid sections showed no statistically significant difference. Nor did outcomes differ across subgroups—whether by race and ethnicity, gender, or college grade point average—indicating that no subgroups of students consistently benefited from or were harmed by the hybrid format. The rigorous design of both of these studies made possible a precise estimate of the differences (or lack thereof) between conditions. As a result, though both reached the same conclusion

as the meta-analyses—that e-learning is, on average, as effective as traditional classroom instruction—their use of random assignment and strong controls engenders more confidence in their findings.

So, what can we ultimately conclude from the multitude of studies comparing the effectiveness of e-learning and other forms of instruction? The current body of evidence appears to support the position asserted by Richard Clark more than two decades ago: pedagogy, not delivery media, is what influences learning. Or as Terry Anderson observes, “It seems clear that there is no single medium that supports the educational experience in a manner that is superior in all ways to that supported via other media.”³⁷ Rather, characteristics of the instructional design, such as the instructional methods used, the feedback provided, and the degree of learner engagement, create the conditions within which learning occurs. The meta-analyses reviewed above show that when instructional design characteristics are held constant across delivery conditions, e-learning and classroom instruction generally produce similar learning outcomes. That finding suggests that delivery media themselves do not affect learning, but rather are simply the vehicles through which instructional conditions are delivered to the learner. Furthermore, the finding suggests that studies designed to evaluate the effectiveness of a particular e-learning technology are of limited value. Indeed, any form of instruction can be effective if it is able to create the conditions necessary for students to learn specific content. As Brown, Charlier, and Pierotti conclude in their review of e-learning, “we could study whether people learn using iPods with no screen, iPods with a small screen, e-readers (e.g., Nooks, Kindles) with black-and-white or color screens, iPads (which have a larger color screen), and <insert future

technology here>. Invariably, the answer to the question will be, yes, people *can* learn using these media” (italics in original).³⁸ Similarly, studies that simply compare different media, without considering differences in instructional methodology or learning environments, do not provide an accurate picture of the effectiveness of one type of media relative to another. Ultimately, research needs to move beyond the “does it work” question toward a better understanding of exactly what does influence the effectiveness of e-learning and thus of the conditions under which e-learning is likely to be most effective.

What Features of E-Learning Influence Its Effectiveness?

Researchers have now begun to investigate the effectiveness of e-learning by evaluating not the different technologies themselves but rather the effects of specific instructional features and supports embedded in them. Several authors have developed conceptual frameworks or typologies of e-learning to help guide such efforts. Steve Kozlowski and Bradford Bell, for example, present a typology that highlights four key categories of instructional features—content, immersion, interactivity, and communication—by which e-learning technologies can create a specific instructional experience.³⁹ By *content* they mean the level of richness with which information is delivered to learners. Text, for example, is low in information richness, whereas images, sound, and video are high. Kozlowski and Bell use the term *immersion* to denote the sense of realism that e-learning can create—the extent to which the learning experience captures the psychological and physical characteristics of a performance. Certain forms of technology, for example, such as simulations, offer greater possibilities for enhancing learners’ sense of being immersed in the educational experience.

The term *interactivity* refers to characteristics that influence the degree and type of interaction between learners (individually or as groups), between learners and instructors, and, increasingly, between learners and simulated characters or virtual agents. Networked forms of e-learning, for example, have expanded the potential for collaboration and interactivity. The final feature, *communication* richness or bandwidth, determines students' ability to communicate verbally and nonverbally. E-learning programs differ in the extent to which they make available different communication channels (for example, audio and video) and allow students to communicate synchronously in real time. Kozlowski and Bell stress that the importance of different features depends on the goals of a particular learning program and the instructional environment that must be created to meet the needs of learners. That is, no configuration of features will be universally effective or ineffective. Rather, effectiveness is determined by the degree of fit between the design of the e-learning and the characteristics of the course for which it is used. Educators can use research of this sort—work that focuses on how different technological configurations can deliver specific instructional features—to guide decisions about which type of e-learning should be used to meet specific learning objectives.

Other conceptual work has focused on isolating specific instructional features of e-learning. Interactivity has received particular attention. In a review of computer games and simulations, Jennifer Vogel and several colleagues argue that interactivity is the key instructional component that influences learning outcomes.⁴⁰ In 1989, Michael Moore identified three forms of interaction in distance education: student-student interaction, student-instructor interaction, and

student-content interaction.⁴¹ Drawing on Moore's typology, Terry Anderson proposed that e-learning can support meaningful learning as long as at least one form of interaction is at a high level.⁴² High levels of multiple forms of interaction may enhance the educational experience, but may make it less cost- or time-effective. What Anderson calls his "equivalency theorem"—that one type of interactivity can substitute for the others with little loss in educational effectiveness—further delineates the different forms of interactivity and shows how different technologies can meet learner needs through different types of interactivity. Future research must directly test the equivalency theorem to learn whether specific types of interaction are better suited than others to meet specific learner needs and instructional objectives.

Empirical research is also shifting away from evaluating whether e-learning works and toward examining the instructional features that influence its effectiveness. Rather than comparing different forms of delivery such as e-learning versus classroom, studies are beginning to compare e-learning programs that differ on important instructional dimensions, including interactivity, engagement and activity, and feedback. Richard Mayer, for example, has conducted research on multimedia learning to better understand how people learn in such environments and to identify which aspects of those environments can help different types of learners acquire different kinds of knowledge.⁴³ Robert Bernard and several coauthors have conducted a meta-analysis to examine how different types of interaction influence the effectiveness of e-learning programs, which they call distance education.⁴⁴ Based on seventy-four effect sizes drawn from seventy-four studies, they found that programs offering moderate to high levels of interaction

had better achievement outcomes than those offering less interaction. They found, interestingly, that programs that incorporated student-student or student-content interaction led to better achievement than those offering student-teacher interaction. They also found that increasing the degree of interaction led to better achievement in the case of student-content interaction, but not student-student or student-instructor interaction. To repeat, the effects of a certain type of interaction will depend on how well it matches the content and objectives of a particular course. Yet, as this meta-analysis shows, on average, interactivity significantly influences the effectiveness of e-learning programs, and certain types of interaction may lead to better outcomes than others.

In summary, research provides evidence that e-learning can effectively deliver instruction in postsecondary settings. As with any delivery media, whether a particular e-learning program is effective in a given situation will depend on its capacity to create the conditions necessary for students to learn. The key challenges now facing college administrators and faculty are to decide when to use e-learning and how to design and deliver it to maximize student achievement. As yet, however, e-learning research provides minimal guidance on these central questions. In other areas, such as the organizational training literature, researchers have mapped the effectiveness of specific training design features, such as lecture, self-instruction, or discussion, as a function of the skill or task being taught.⁴⁵ Such research can guide decisions about what methods should be used to teach different skills or tasks. As noted, similar research evaluating the effectiveness of e-learning features such as interactivity and immersion for teaching different content would help curriculum planners decide

when e-learning is appropriate and what type of e-learning should be used to deliver the features critical to learning in a particular course or program.

Barriers to E-Learning in Postsecondary Education

Observers have pointed to a number of potential obstacles to e-learning instruction in higher education.⁴⁶ In this final section we examine several emerging issues and trends that we believe may create significant barriers to the widespread adoption of e-learning in the nation's colleges and universities.

Fraud and Cheating Online

As evidence accumulates about how to make online learning effective, concerns are growing about problems that e-learning poses for students' academic integrity. Academic dishonesty has typically been characterized by the following offenses: "acts of plagiarism, using concealed notes to cheat on tests, exchanging work with other students, buying essays or, in some extreme and notorious cases, asking others to sit examinations for you."⁴⁷ Research has long documented the widespread prevalence of such forms of dishonesty in postsecondary institutions.

In 1964, for example, Bill Bowers published the first large-scale study of self-reported cheating in postsecondary institutions.⁴⁸ In a sample of more than 5,000 students from ninety-nine U.S. colleges and universities, he found that three-quarters of the students had engaged in at least one dishonest academic behavior. During the 1993–94 academic year, Donald McCabe and Linda Trevino surveyed approximately 1,800 students at nine of the schools that had participated in Bowers's original study.⁴⁹ They found that although the share of students who cheated had increased only slightly, from 63 percent

in 1963 to 70 percent in 1993, cheaters from the 1993 group engaged in a wider variety of cheating, cheated more often, and engaged in more forms of exam cheating. The share of students admitting to collaborating on individual assignments jumped from 11 percent in 1963 to 49 percent in 1993.

More recently, studies have begun specifically to examine academic dishonesty in online learning environments. In 2006, Mark Lanier surveyed 1,262 students at a large, state-funded university and found that self-reported cheating was more prevalent in online classes than in traditional lecture courses.⁵⁰ In 2000 Kristen Kennedy and several colleagues found that both students and administrators believe it is easier to cheat in distance learning classes.⁵¹ Kenneth Chapman and several colleagues conducted a survey of 824 business students, both undergraduate and graduate, and found that approximately 75 percent admitted to cheating at some point in their courses.⁵² Among those who had taken an e-learning course, 24 percent admitted to having cheated on a web-based examination. More strikingly, 42 percent indicated that they would cheat on electronic exams if given the opportunity. A recent report by the Government Accountability Office (GAO) also reported a set of alarming findings pertaining to faculty and administrative toleration of academic dishonesty in online courses at for-profit institutions.⁵³

Many institutions are exploring ways to address cheating in online courses, including having students take exams on campus or in testing centers or replacing high-stakes testing with assessments, such as longer-term projects, that are seen as less susceptible to cheating.⁵⁴ Perhaps more important, colleges must ensure that institutional policies

regarding academic dishonesty and course grading standards are followed strictly to create a culture of academic integrity in the online environment. The work of Donald McCabe, Linda Trevino, and Kenneth Butterfield suggests that perceived social norms, attitudes toward cheating, and knowledge of institutional policy regarding cheating will generally predict course conduct from students in online learning environments.⁵⁵

Low-Income and Underprepared Students

One argument in favor of e-learning is its potential to improve access to higher education among lower-income and academically underprepared students. Online learning, supporters say, makes postsecondary education more affordable, expands geographic access (for example, to rural areas), and provides needed flexibility for students who cannot attend traditional classes because of full-time work and child-care responsibilities. Realizing that potential, however, will not be easy.

Over the past two decades, much public discussion has focused on “digital divides” and their implications for both youth and adults. In an article in the *Encyclopedia of Adolescence* Linda Jackson describes three generations of such divides, all by income and race.⁵⁶ The first generation was the divide in access to digital technologies, especially the Internet; access increased with income and was higher among whites than African Americans. As public access to the Internet increased in schools, libraries, and other public spaces, a second digital divide emerged, again primarily by income and race, this one based on broadband Internet access. Researchers, educators, and policy makers have argued that broadband access fundamentally changes the way people interact

with the Internet, including how often they go online, how much time they spend, and what they do. As these gaps have shown signs of narrowing, yet a third digital divide, this one in the intensity and nature of Internet use, has gained attention. Research has shown that among those with access to the Internet, African Americans go online less often than their white peers. A gap is also growing between youth who use the Internet in diverse and engaging ways, such as social networking or searching for information about major life issues (health care, finding a job), and youth who use it as a more narrow and less engaging resource, such as seeking entertainment online through music or video clips. These types of divides too tend to be structured along racial and ethnic and socioeconomic backgrounds.

The digital divides, particularly the third-generation divide, can lead to differences not only in users' cognitive, social, and psychological development but also in their technology skills and confidence. And because lack of confidence is one of the most frequently cited barriers to adult Internet use, these digital divides may, ironically, decrease enrollment in e-learning among the very groups for whom e-learning is supposed to expand postsecondary access. The divides may also raise dropout rates among students who enroll in e-learning. Online courses, in fact, often have significantly higher dropout rates than face-to-face courses.⁵⁷ One primary reason students give for dropping out is technical problems—problems that students without access to broadband Internet may be especially likely to experience.⁵⁸ And students who lack technology skills and confidence may be less likely to persist when such problems arise. Thus, if e-learning is to increase access to college among low-income students and specific racial and ethnic groups, institutions

will have to address digital divides in terms not only of students' access to technology but also of their technology skills and literacy.

Online courses, in fact, often have significantly higher dropout rates than face-to-face courses. One primary reason students give for dropping out is technical problems—problems that students without access to broadband Internet may be especially likely to experience.

Underprepared students too may face barriers to success in e-learning courses. Figlio, Rush, and Yin, for example, found, in the study already noted, that students with low grade-point averages who enrolled in the e-learning section of a microeconomics class scored significantly lower on course exams than did those in the live instruction section.⁵⁹ Research examining underprepared students, though limited, has typically reached a similar conclusion: academically underprepared students often perform worse than their peers in online courses. The finding is not surprising in light of the importance of self-regulatory skills in learning generally. And given that e-learning often shifts to the learner more control over important learning decisions, such as what and how much to study, self-regulatory skills such as self-monitoring and self-evaluation become even stronger predictors of student motivation,

achievement, and course completion. One way to improve the skills of underprepared students is to build instructional supports into e-learning courses to help students self-regulate and make effective use of the control they are given over their learning.⁶⁰ Several interventions that prompt self-regulation through reflective questions also show promise for supporting critical learning processes during e-learning, though more work is needed to evaluate the specific effectiveness of these interventions among academically underprepared students.⁶¹ Educators' increasing interest in learning analytics also holds promise for overcoming the barriers faced by these students. Data collected from large populations of online learners can provide insight into the usage and performance of different types of learners and help curriculum planners design courses that meet the specific needs of underprepared students.⁶²

Cost Issues

Although one of the most common reasons given by academic leaders at postsecondary institutions for developing online courses and programs is to generate new revenue streams and potentially to lower the costs of providing a postsecondary education, the cost-effectiveness of e-learning remains largely an open question. Lawrence Bacow and his coauthors report that relatively few institutions believe e-learning reduces their costs, and, in fact, most believe that online courses are at least as expensive to provide as traditional courses.⁶³ This perspective is based largely on the significant start-up costs of e-learning, including investments in technology, course design, and the training of instructors, but also on recurring costs, such as those that result from increased coordination demands and technical support. These costs can be a significant barrier to entry for institutions seeking to adopt e-learning instruction. Indeed, Babson

Survey Research Group estimates that a small subset of postsecondary institutions currently educate the majority of online students and predicts that future growth will come largely from those same institutions rather than from new institutions.⁶⁴

Nevertheless, some analysts believe that e-learning can reduce the cost of education. Bowen and his coauthors, for example, ran several cost simulations to try to estimate how much the institutions in their study could save by shifting to hybrid learning.⁶⁵ Although the simulations are speculative and the results vary depending on the assumptions that are adopted, they show that hybrid learning may promise significant savings in total instructor compensation costs. In higher education today, far more e-learning courses are led by instructors rather than by machines, thus limiting the extent to which institutions can realize these cost savings. But future adoption of more interactive, machine-guided courses could significantly lower costs.⁶⁶ Tamara Battaglino, Matt Halderman, and Eleanor Laurans stress that the important question is not simply whether e-learning is cheaper but whether it can achieve similar or better learning outcomes at a lower cost.⁶⁷

Other Unanswered Questions

Several other important questions will require the attention of educators, administrators, and policy makers as postsecondary e-learning continues to expand. One such question concerns the impact of e-learning on more distal measures of student achievement, such as retention and the transfer of learning, both to other courses and to the workplace. Most e-learning studies assess student achievement during the course itself or immediately upon completion. When these studies assess retention at all, they usually do so within a month of when students finish

the course.⁶⁸ In addition, they often assess achievement based on students' cognitive knowledge and attitudes, at the expense of other important learning outcomes, such as how they apply what they are learning. Admittedly, the failure to assess achievement using longer-term measures is not confined to research on e-learning; much of the adult learning research focuses on shorter-term, cognitive outcomes. Yet it is not possible to grasp fully the implications of e-learning in postsecondary settings without examining how it affects students' ability to retain and apply what they have learned.

As colleges increasingly seek to make their e-learning courses available to an international audience, it will also be important to conduct research that spans different countries and cultures. Much of the research in this area has been conducted using college students in the United States, which raises questions about whether findings will translate across national and cultural boundaries. For instance, students' attitudes toward and acceptance of e-learning may vary depending on their cultural norms, beliefs, and values. In addition, research has found that cultural differences in technology use and digital divides that have been largely addressed in the United States continue to persist in other parts of the world, such as rural China.⁶⁹ In other parts of the world, it may also be important to shift attention from how e-learning compares to classroom learning to how e-learning can provide postsecondary educational opportunities that otherwise do not exist.

Conclusion

The use of e-learning in postsecondary education has expanded rapidly over the past decade, and all indicators suggest that growth will continue in the years to come. E-learning has also attracted intensive research interest, with thousands of studies over the past several decades examining its effectiveness. Although the dominant paradigm in this area—comparing e-learning with classroom instruction—has long been faulted, research is only now beginning to move away from the “does it work” question toward a greater focus on understanding the role of different instructional features and supports in determining the effectiveness of e-learning. Future research should use rigorous experimental designs to examine how e-learning programs that vary in terms of content, interactivity, and other important instructional features affect students' ability to acquire different types of knowledge and skills. Yet advances in e-learning design must also be coupled with efforts to eliminate current barriers to the widespread adoption of online instruction. Academics and institutions need to collaborate to address the challenges surrounding academic integrity in online environments, devise effective support systems for underprepared learners, evaluate the economic models that underlie e-learning, and understand how to deliver e-learning across geographic and cultural boundaries.

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Access and Success with Less: Improving Productivity in Broad-Access Postsecondary Institutions

Davis Jenkins and Olga Rodríguez

Summary

Achieving national goals for increased college completion in a time of scarce resources will require the postsecondary institutions that enroll the majority of undergraduates—community colleges and less-selective public universities—to graduate more students at a lower cost. Davis Jenkins and Olga Rodríguez examine research on how these “broad-access” institutions can do so without sacrificing access or quality.

Research indicates that the strategies broad-access institutions have relied on in the past to cut costs—using part-time instructors and increasing student-faculty ratios—may in fact reduce productivity and efficiency. The limited evidence available suggests that some of the most popular strategies for improving student success are not cost-effective. New strategies to cut costs and improve college success are therefore imperative.

Some believe that redesigning courses to make use of instructional technologies will lead to better outcomes at lower cost, although the evidence is mixed. Recently, a growing number of institutions are going beyond redesigning courses and instead changing the way they organize programs and supports along the student’s “pathway” through college. These efforts are promising, but their effects on cost per completion are not yet certain. Meager funding has so far hampered efforts by policy makers to fund colleges based on outcomes rather than how many students they enroll, but some states are beginning to increase the share of appropriations tied to outcomes.

Jenkins and Rodríguez argue that as policy makers push colleges to lower the cost per graduate, they must avoid providing incentives to lower academic standards. They encourage policy makers to capitalize on recent research on the economic value of postsecondary education to measure quality, and urge colleges and universities to redouble efforts to define learning outcomes and measure student mastery.

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State and national efforts to achieve goals of increasing college attainment and expanding equity within postsecondary education depend critically on community colleges and less-selective public four-year colleges and universities, which enroll nearly 60 percent of all U.S. college students.¹ These broad-access colleges and universities have completion rates lower than those of more-selective institutions and are struggling financially as declining state budgets and competing priorities have led states to scale back their financial commitments to public higher education. To contribute to increased college attainment, they must improve student completion rates without sacrificing access or quality as public resources decline. In short, they must become more productive, and in the face of dwindling public resources, that means becoming more efficient as well.

In this paper we review research on the productivity of broad-access public postsecondary institutions and examine what they can do, given fiscal constraints, to improve undergraduate completion rates without sacrificing access or quality. Although much of the debate among policy makers and the public about the rising costs and uncertain quality of higher education has centered on elite private colleges and public research universities, we focus on public broad-access institutions because of their important societal role in providing access and addressing inequality. As Michael Kirst, Mitchell Stevens, and Christopher Proctor write, “Colleges are not more or less selective. They are more, less, and variably accessible. Broad access—by which we mean the ability to enroll regardless of socioeconomic and academic background—should be regarded as a positive educational, institutional, and societal value.”² Kirst and his coauthors

include under the “broad access” rubric the for-profit postsecondary institutions discussed by Claudia Goldin, Larry Katz, and David Deming in their article in this issue.³ Because of limited research on the economics of the for-profit sector, we exclude those institutions and focus instead on public two-year colleges and public master’s institutions (four-year colleges that grant master’s degrees), whose mission is teaching rather than research.⁴

Broad-access public institutions are much more dependent than selective public and private institutions on public funding, an increasingly constrained resource. State and local appropriations have declined in the wake of the “Great Recession” after being mostly flat for a decade. Given that providing access to postsecondary education is central to their mission, a key reason for their dependence on public funding is that they are more constrained than other institutions, including public research universities, in their ability to raise tuition and private donations to replace declining public dollars. Community colleges in particular, with their “open door” mission, are reluctant to increase tuition and fees so as not to limit access. During the Great Recession, community college enrollment soared, and tuition increases did not fully compensate for the decline in public funding. Per-student revenues at broad-access public universities also declined.⁵ A 2012 survey by Sallie Mae found that families are increasingly seeking to cut college costs by choosing lower-cost institutions.⁶ In fact, during the 2011–12 academic year more than half of families eliminated more expensive institutions as options based on price even before applying. Because community colleges and public four-year master’s universities have the lowest tuition and fees, they will likely continue to draw students seeking more affordable access to higher education.

As the plethora of state and national initiatives related to college attainment indicates, increasing the number of graduates from broad-access colleges and universities while maintaining access and quality is of key social and economic importance. Yet how to accomplish that goal without additional resources—in effect, how to bend the cost curve down as mentioned in the article by Sandy Baum, Charles Kurose, and Michael McPherson in this issue—is far from obvious.⁷ In this article we review research for ideas on how to meet this challenge. Because of rising costs and funding constraints, we examine not just productivity—which measures how many degrees and credits institutions produce with a given amount of labor and other inputs—but also efficiency or unit cost, defined as the amount of resources spent to produce one graduate. Broad-access institutions would become more efficient by spending less to produce a graduate of equal quality.⁸ We also explore the strategies that broad-access institutions have used to improve productivity and efficiency in the past and what innovations and policy strategies hold promise for the future.

Measuring the Productivity and Efficiency of Postsecondary Institutions

The concept of productivity in postsecondary education is as elusive as it is important. In public discourse and to some extent in research the term “productivity” is often used interchangeably with “efficiency” and “cost-effectiveness,” though all have different meanings. Even seemingly concrete terms such as cost, expenditure, and tuition are frequently used in imprecise ways.⁹ And even when it is clearly defined, productivity in higher education is hard to measure, especially in the absence of clear ways to understand the quality of graduates produced.

As defined by a 2012 National Research Council (NRC) report on measuring productivity in higher education, productivity is the ratio of changes in output (degrees completed and credit hours passed) to changes in inputs (labor as well as nonlabor resources).¹⁰ The NRC report noted that inputs, in particular, are difficult to measure, in part because of data infrastructure constraints at colleges, which do not routinely and consistently collect data on fields of study, faculty use of time, and student effort.

Given the difficulty of measuring productivity as defined above, it is not surprising that it has rarely been attempted. The NRC report notes that because of varying missions, levels of selectivity, and the heterogeneity of inputs and outputs among postsecondary institutions, the measure is more appropriate for analyzing the performance of large groups of institutions than that of individual colleges and universities. A 2012 research review by Clive Belfield found only one study that measures it. According to Belfield, other studies claiming to measure productivity at four-year institutions in reality measure efficiency or unit cost—the cost of producing a graduate. Unit cost does capture productivity in that, faced with the same input costs, more productive institutions will have lower unit costs than less productive institutions.¹¹ Unlike productivity, however, efficiency also accounts for changes in the cost of inputs. For example, a factory that increases its shoe production from 100 to 150 pairs a day with the same inputs can be considered to have become 50 percent more productive. But if the cost of labor and other inputs also rises 50 percent, say from \$100 to \$150 a day, the factory is no more efficient, because it still costs \$1 to produce a pair of shoes. Because of the finite—and even declining—resources available to

broad-access public institutions, if they increase productivity without also improving efficiency, they will fail to achieve the goal that educators and policy makers seek—graduating more students at lower cost.

Some scholars point to structural barriers to improving productivity within higher education. Drawing on the work of economists William Baumol and William Bowen, some have argued that the primary reason for rising costs and lagging productivity in higher education is the difficulty of substituting capital for labor, as other industries do.¹² Because of this so-called “cost disease,” wages in education must rise to allow postsecondary institutions to compete to attract and retain talent with other sectors of the economy that employ highly skilled workers. At the same time, because postsecondary education is so labor-intensive and because colleges have not yet been able to develop and implement instructional technologies to substitute for teachers (to offset the rising cost of labor), they must raise prices. A competing hypothesis, “revenue theory,” holds that the difficulty colleges and researchers face measuring the quality of the products of higher education means that availability of revenues, not calculated need, drives spending levels.¹³ Recent research by Robert Archibald and David Feldman suggests that the cost disease has likely been the primary driver of the rising cost of higher education.¹⁴ By comparing changes in the cost of higher education with price changes in other industries from 1929 to 1995, they show that the trend in the cost of higher education (that is, cost for each full-time equivalent student) was very similar to the trend in the cost of personal services that depend on highly educated labor. Archibald and Feldman look at costs of higher education generally and do not disaggregate their findings by different type of institution. Jane

Wellman, however, sees the revenue theory as being more applicable for broad-access institutions, which face less competition for students and for faculty and receive a negligible share of revenues from private resources.¹⁵ Although Wellman’s argument is compelling, there is no definitive evidence about which theory is best suited to broad-access institutions.

In this article we follow the existing literature in focusing more on institutional efficiency, or unit cost, than on productivity (although we do discuss the latter). Measuring unit cost may be less difficult than measuring productivity in that it does not require measuring inputs, which can be highly variable (as with student ability) and substitutable (as when colleges use adjunct instructors instead of full-time professors).¹⁶ Measuring costs does, however, require confronting confusion surrounding definitions, inconsistencies in accounting methods, and the need to distinguish spending on different categories of students.¹⁷ Still, measuring costs is arguably easier for broad-access institutions than for research institutions, because of the additional complexities associated with measuring research costs.¹⁸ One final argument in favor of a focus on efficiency is that policy makers’ focus on the use of public resources leads them to be more receptive to conversations about unit cost than about productivity in the technical sense.

The Quality Conundrum

There is no commonly accepted method for measuring the quality of a college education, and efforts to measure productivity or efficiency in higher education are confounded by the challenge. Colleges are not more productive if they graduate more students but with weaker skills; they are more productive only if the added graduates have at least

equivalent skills. Similarly, measures of unit cost must be adjusted for quality of output, because a college or university that manages to reduce the cost of graduating students can be considered more efficient only if the less costly degrees produced are of equal or greater quality. Absent a clear way of measuring quality, using productivity or efficiency measures in accountability frameworks or as the basis for funding decisions risks creating perverse incentives. Using those measures without adjusting them for quality could lead institutions, for example, to reduce access for disadvantaged students because they are less likely to graduate. It could also lead to lower standards for passing courses and earning degrees or to credentials of limited value in education or the workplace. The NRC panel on measuring productivity in higher education warned that not addressing quality could spur a “race to the bottom.”¹⁹ Ultimately, then, our interest is in quality-adjusted productivity and efficiency.

Traditionally the quality of postsecondary institutions has been assessed by measuring the quality of the inputs, such as student readiness, faculty salaries, or student-faculty ratios. Efficiency and productivity measures depend on the quality of outcomes, rather than of inputs. More recently, efforts have been made to measure the quality of the *outputs* of undergraduate education. Such measures fall into four categories.

Standardized tests. One proposal has been to establish a uniform college exit exam to indicate quality. Some colleges are already using instruments such as the Collegiate Learning Assessment to measure how much students are learning. Some experts, however, argue that standardized tests are inadequate to measure the breadth of learning in college.²⁰

External certification. In some occupational fields, such as accounting and nursing, certification or licensure assessment systems established by industry or by professional groups can be used as an indicator of quality.²¹ Such certifications, designed to ensure that entrants to a field have the knowledge and skills they need, are, however, available only in a few fields, such as health care, manufacturing, mechanics, and information technology.²²

Learning outcomes standards. Over the past twenty years, standards stipulating the knowledge and skills that students are expected to master in a course or program have become a major focus of the higher education accreditation process. Precisely how to assess and provide evidence of student learning, however, remains uncertain.²³ A 2009 survey of college leaders by the National Institute for Learning Outcomes Assessment found that many undergraduate institutions have not fully adopted such assessments, although community colleges are more likely than selective and doctoral-granting institutions to have done so and to use them to improve instruction and allocate resources.²⁴ The Lumina Foundation is spearheading an effort (modeled on Europe’s “Bologna Process”) to develop degree profiles specifying what U.S. students should know and be able to do when they have earned a postsecondary credential at a particular level. That effort is still in the early stages, however, and until different institutions subscribe to a common set of learning outcomes, it will not be possible to compare quality and thus efficiency or productivity across institutions.

Earnings of graduates. Postgraduation earnings are a salient way of measuring the economic benefit of a college degree, and thus its quality. Until recently, linking the

earnings of graduates with their degrees has posed many challenges, including the limited availability of data spanning graduates' years in college and in the workforce, as well as the need to adjust for previous employment, field of study, region, and other factors.²⁵ A growing body of research on the returns to education links student educational records with Unemployment Insurance wage records, thus addressing some of these challenges. Such research makes it possible to assess the economic benefits of college credentials of particular types and in particular fields.²⁶

Not being able to measure quality consistently makes it difficult for college administrators and researchers to accurately gauge changes in efficiency and productivity in an institution—and among programs within an institution. For this reason, studies of efficiency or productivity generally assume that educational quality is constant across degrees. Some researchers maintain that because the readiness, or input, of students entering community colleges in particular has declined, the quality of graduates, or output, from these institutions may also have declined.²⁷ Others question that conclusion, arguing that the economic returns to a college education, whether from a two- or four-year institution, have remained positive for some time, indicating that in the aggregate the value of college degrees has not declined.²⁸ Community colleges and other open-access institutions are obliged by their mission to serve the students who come to them. Yet a decline in students' readiness does not necessarily translate into a decline in the quality of the education provided to students.

Although state governments and accrediting agencies play a part in monitoring quality, their role has been more to ensure a minimum level of quality than to differentiate

colleges by quality or to determine trends in quality of outcomes over time.²⁹ Accreditation agencies generally do not directly examine outcomes such as graduation rates or the quality of degrees. Still, state governments are showing signs of interest in motivating better performance by higher education institutions, though their efforts generally focus on performance measures such as completion rates and not on quality per se. Many states are also adopting or exploring policies to fund postsecondary education based on performance rather than on enrollment. States and independent organizations are building tools to allow consumers to compare institutions by graduation rates and other measures. The federal government too is trying to measure the returns to higher education and ensure a minimum level of quality. For occupational programs, the new “gainful employment” rule, discussed in the article in this issue by Andrea Venezia and Laura Jaeger, is an example of the federal government trying to measure employability and the returns to higher education to ensure a minimum level of output quality.³⁰

In what follows we examine trends in productivity and efficiency in broad-access institutions as well as strategies for increasing both. Until analysts are better able to answer questions about how to adjust for quality, these measures are best used with caution. In our conclusion, we consider how to ensure that broad-access institutions do not increase efficiency and productivity at the expense of quality.

Trends in Productivity and Efficiency among Broad-Access Institutions

Broad-access institutions are often considered efficient because of their comparatively low cost both to taxpayers and to students. In

Table 1. Completion Rates by Type of Postsecondary Institution

Institutional control	Type of institution	Graduation rate (percent)
Public	Two-year	20
	Four-year, overall	56
	Open admissions	29
	Less than 25 percent accepted	82
Private nonprofit	Two-year	55
	Four-year, overall	65
	Open admissions	36
	Less than 25 percent accepted	91
For-profit	Two-year	58
	Four-year	28

Source: Thomas D. Snyder and Sally A. Dillow, "Digest of Education Statistics, 2011," NCES 2012-001 (Washington: U.S. Department of Education, National Center for Education Statistics, 2011).

Note: "Graduation rate" is percentage of first-time, full-time students who complete in 150 percent of the expected time to complete a given program.

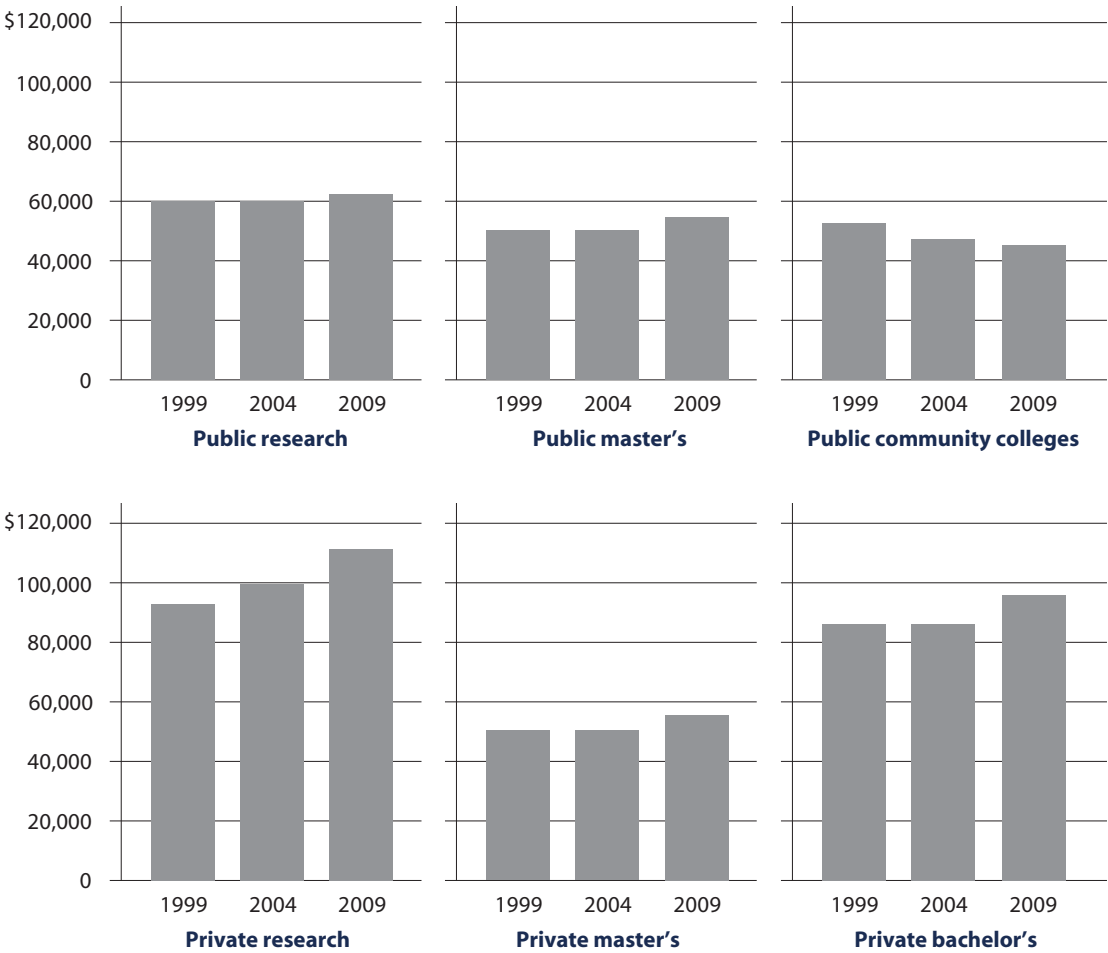
2009, public two-year colleges spent an average of \$10,242 per student on education and related expenditures (\$7,124 in state and local funding and \$3,118 in tuition), and public master's institutions spent \$12,364 (\$6,441 in state and local funding and \$5,923 in tuition). In comparison, public research institutions spent an average of \$15,919 (\$7,889 in state and local funding and \$8,030 in tuition) while private research institutions spent \$25,596.³¹ These two sources—state and local funding and tuition—together with financial aid make up the majority of resources available to broad-access institutions, while private institutions and research institutions typically have private donations and endowment income available as well.

Lower expenditures, however, do not necessarily translate into greater efficiency. While cost per *student* is generally the lowest at community colleges, the cost per *degree* is

not as low as one might expect. In 2009, public research institutions spent an average of \$65,632 per bachelor's degree; broad-access four-year institutions, \$55,358 per bachelor's degree; two-year colleges, \$73,940 per associate's degree.³² Differences across these sectors cannot be fully understood without looking at the underlying degree completion rates—in particular, the comparatively low degree completion rates at broad-access institutions (table 1).

Such comparisons, however, do not place a value on access for disadvantaged populations. In addition, comparing two- and four-year colleges on the basis of cost per degree is probably not fair given that two-year colleges produce credentials other than associate's degrees. Taking into account both certificates and diplomas reduces cost per completion for community college substantially—from \$73,940 to \$46,757 in 2009.³³

Figure 1. Average Education and Related Spending Per Completion, AY 1999–2009 (in 2009 dollars)



Source: Donna M. Desrochers and Jane V. Wellman, *Trends in College Spending, 1999–2009* (Washington: Delta Cost Project, 2011).

And even this adjustment does not account for either the value community colleges offer in providing general education courses to students seeking to transfer to bachelor's programs or the "option value" of trying out a postsecondary education.

Because our focus is on the prospects for improving productivity and efficiency, we are particularly interested in trends in measures such as degree production and cost per graduate. We turn to these next.

Trends in Degree Production

According to a 2011 report by the Delta Cost Project, broad-access institutions increased their output on a number of measures over the most recent ten years for which data are available. Between 1999 and 2009, they increased the total number of degrees and certificates they produced for each student attending, although quality questions and degree mix complicate the comparison.³⁴ For example, although community colleges in

particular made sizable gains, the largest gain was the substantial increase in the number of short-term certificates awarded.³⁵

Trends in Efficiency, or Unit Cost

That broad-access institutions increased their degree production over the past ten years does not mean they became more efficient in that they spent less per graduate. In fact, among public universities generally, spending per graduate *increased* during the ten years from 1999 to 2009, although the increases were less rapid among broad-access public universities than among public and private research universities (figure 1).³⁶ Among all types of postsecondary institutions, only community colleges spent less per completion (and even less if occupational certificates are counted) in 2009 than they did in 1999, although the average cost per community college credential has remained fairly stable since the 2001 recession. Belfield's in-depth study of cost efficiency among community colleges found that the average cost per completion among community colleges with an academic transfer focus declined by nearly a quarter (24 percent) between 1987 and 2008; average cost per completion among two-year public technical colleges declined by nearly one-third (30 percent).³⁷

No research has yet explained definitively why unit costs declined in community colleges and increased in public master's colleges at a lower rate than in research universities and private universities. A logical explanation, discussed in the article by Baum, Kurose, and McPherson in this issue and consistent with the revenue theory, is that amid declines in state and local funding, broad-access institutions were more constrained than public research institutions or private institutions in their ability to raise tuition.³⁸ Because of their mission,

the composition of their student body, and the priorities of legislatures in many states, broad-access institutions face pressure to keep student tuition and fees low. As a result, in 2009, community colleges spent less per student than they did ten years earlier on instruction and academic support, although per student spending on student services increased modestly.³⁹ During the same period, public master's universities increased their spending on instruction and academic support, but did so more slowly than did public research universities, which already spent considerably more on instruction and student support than did the less selective public universities and far more than community colleges.

As Wellman notes, in all states the share of state funding going to higher education has declined over time, and the trend is most pronounced in broad-access institutions.⁴⁰ Even so, these institutions have not reduced output in proportion to their losses in funding, and so appear to have become more efficient. If we assume that quality of output has remained constant, the trends in unit cost look promising. The lack of widely accepted measures of quality of the credentials awarded, however, makes it impossible to be sure whether efficiency has increased—or whether the budget-driven decreases in cost per degree (at two-year colleges in particular) have come at the expense of quality.

Strategies for Improving College Productivity and Efficiency

Given the limited understanding of the concepts of productivity and efficiency both among the public and among postsecondary institutions, it is perhaps not surprising that certainty about how to improve them is in short supply. Institutions can improve

performance either by increasing degree production with a given level of resources or by reducing the cost of producing degrees. Although broad-access institutions are able to do both, they have focused on the latter. Below, we review research on the effects of their cost-cutting measures and then examine the prospects for improving productivity and efficiency using other strategies.

Effects of Cost-Cutting Strategies

Both community colleges and public master's universities have increasingly relied on part-time instructors to control costs. At public two-year colleges, in fall 1992, 46 percent of the faculty was employed part time; by fall 2010, the share had risen to 70 percent. At public four-year universities, the share of part-time faculty rose from 12 percent to 37 percent during that interval.⁴¹ Though the only available research is nonexperimental (an experimental study would be extremely complicated to design), it offers reasons to think that greater use of part-time faculty may be harmful to productivity if not educational quality.

Several studies find that increased use of adjunct faculty is associated with poor student completion and transfer rates in two- and four-year institutions, although other research finds a small positive effect of using adjuncts, especially in occupational fields, such as allied health, information technology, and business.⁴² Moreover, one study provides evidence that switching from part-time to full-time instructors would be an efficient way to increase completion rates in both two- and four-year institutions, although the estimated gains for four-year institutions are less given their higher costs for full-time faculty.⁴³ For community colleges and broad-access universities, both of which have relied heavily on the use of part-time instructors to respond

to declining public funding and increasing enrollment, the implication is that rethinking their strategies could help them be more efficient and productive.

Another cost-cutting strategy that broad-access institutions have pursued for decades is to increase the number of students served by faculty. In fall 1999, the number of full-time equivalent (FTE) students per FTE faculty at community colleges was 18.4; at public four-year institutions, it was 14.5.⁴⁴ By fall 2009, these figures had risen to 21.7 at the former and 15.3 at the latter.⁴⁵ John Bound, Michael F. Lovenheim, and Sarah Turner found that between 1972 and 1992, mean student-faculty ratios fell among the top fifty public-sector universities and highly selective private institutions, while rising 14 percent in the public non-top-fifty sector and 40 percent in community colleges.⁴⁶

Bound, Lovenheim, and Turner estimated that increasing the student-faculty ratio by 1 percentage point would decrease degree completion by 4.0 percentage points in less-selective public four-year institutions, but only 0.5 percentage point in community colleges, where, they found, student characteristics have a larger impact on completion rates than institutional practices do.⁴⁷ Examining these findings in relation to estimated costs and prevailing efficiency levels, Douglas Harris and Sara Goldrick-Rab estimated that decreasing the student-faculty ratio would do little to improve cost per completion in community colleges. They found that reducing the student-faculty ratio would also not be cost-effective in four-year colleges generally, although the stronger effects estimated by Bound and his co-authors for less-selective public four-year colleges may make this strategy an effective way to improve efficiency in these institutions.⁴⁸

These studies suggest that the two common strategies used by such institutions to cut instructional costs—increased use of part-time instructors and increased student-faculty ratio—have done little to improve productivity and efficiency and could well harm both. How they affect the quality of graduates is unknown, but there is little reason to assume that they have improved it.

Strategies for Increasing Degree Production While Cutting Costs

The research cited above suggests that using more full-time instructors could actually increase productivity and efficiency in broad-access institutions and that lowering student-faculty ratios could have a similar effect, particularly in four-year institutions. Despite the plethora of student success initiatives being pursued by colleges and universities, surprisingly little rigorous research exists either on strategies for improving persistence and completion among students in undergraduate programs or on the cost-effectiveness of student success strategies. We next examine research on several different strategies, starting with discrete programmatic interventions and moving to more systemic reforms.

Programmatic interventions. Using existing studies to assess the cost-effectiveness of a wide range of strategies for improving student success, including college access programs, student services, and counseling, Harris and Goldrick-Rab found few programmatic interventions whose estimated effects on student completion justified their costs.⁴⁹ Only call centers, which contact struggling students to recommend assistance, were found to be cost-effective, although the effects on completion are, unsurprisingly, small. The benefits of some of the most common approaches to improving college access

and success, such as Upward Bound and enhanced student services, were found not to be cost-effective. While Harris and Goldrick-Rab focused on more methodologically rigorous studies of program effects, their analysis does not collect detailed cost data and instead relies on program budgets or data on average college spending to estimate costs. Thus the estimates of the impact on the cost per outcome of particular interventions may lack precision.

Remediation. The extensive use of remediation at community colleges and other broad-access institutions has raised the question of whether it can be delivered more cost-effectively. As discussed in the article in this issue by Eric Bettinger, Bridget Terry Long, and Angela Boatman, rigorous studies of the effect of remediation on completion have produced mixed results, with some studies finding no benefits and others positive effects.⁵⁰ Furthermore, other findings suggest that the impact of remediation varies by type of student. Depending on which set of findings one accepts, Harris and Goldrick-Rab estimate that the effect of remediation on the cost of completion is either zero or positive.⁵¹

As part of its multisite Opening Doors demonstration, the social science research organization MDRC conducted a rigorous study of another remediation strategy—a learning community program at Kingsborough Community College in Brooklyn, New York.⁵² In this one-semester program, cohorts of freshmen took three classes together and received enhanced counseling and tutoring as well as textbook vouchers. The study, which compared a group of students randomly assigned to the learning communities program with a control group who received Kingsborough's standard services and courses, found that the program increased

the proportion of students who earned a degree by 4.6 percentage points after six years. It also found the program cost-effective, with the cost per degree earned lower for the program group than for the control group. Another random-assignment study by MDRC of learning communities programs at six other community colleges, however, found them less cost-effective than the regular college services.⁵³ MDRC researchers argued that the Kingsborough model was more comprehensive than models examined in the other study and that it linked courses more strategically and provided enhanced support services.⁵⁴ They concluded that the positive impacts of the Kingsborough model may not be easily replicated at other institutions.

Online learning. Online learning is often mentioned in policy discussions as a way to increase access to higher education while also improving efficiency. But as Bradford Bell and Jessica Federman discuss in their article in this issue, research on the effectiveness of online learning is mixed.⁵⁵ While some types of online learning may be more effective than face-to-face instruction for some learners, recent studies suggest that academically underprepared students of the sort frequently served by community colleges and other broad-access institutions generally do worse in online courses than in those where instruction is face-to-face.⁵⁶ For online courses to work for poorly prepared students, colleges would need to rethink how they are designed and delivered and provide stronger supports for students. Whether that can be done cost-effectively and thus fulfill the promise of online learning to improve access to quality postsecondary education at a reduced cost remains to be seen. As noted by Bell and Federman, most practitioners believe that the substantial start-up costs and ongoing

costs of coordination and technical support make online courses at least as expensive as traditional ones.

Course redesign. The approach taken by the National Center for Academic Transformation (NCAT) to help faculty at scores of colleges and universities redesign courses using instructional technology and labs or studios may be effective in reducing the costs and improving outcomes in individual courses, particularly large lecture courses. NCAT has reported positive results, including both reduced course cost and improved student learning and course completion. Based on its initial work with thirty institutions, NCAT reported an average cost savings of 37 percent (ranging from 20 percent to 77 percent). Of the twenty-four institutions that measured course completion, eighteen showed increases.⁵⁷ The NCAT approach, however, has not been rigorously evaluated by outside researchers.

Redesign of instructional programs and services. Whether the NCAT course-redesign model translates into increased completion and reduced costs (and thus increased efficiency) of entire academic programs and institutions is unclear. Research on organizational effectiveness in and outside of higher education suggests that no one innovative practice or even set of practices can bring about improvements in organizational performance, that such practices must be implemented in a coordinated, complementary way and at a substantial scale.⁵⁸ The implication is that colleges and universities will have to fundamentally redesign the way they structure and manage programs and support services. Observational studies by Patrick Terenzini, Hyun Kyoung Ro, and Alexander Yin find that the way in which colleges organize and manage instruction and student supports

has a strong effect on student learning and persistence that is independent of student characteristics and the type of institution in question—verifying that organization matters for performance.⁵⁹ Other observational studies find that colleges and universities that are more effective in graduating students align their policies and practices generally to facilitate student completion.⁶⁰

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Research on community colleges in particular finds that their practices are often not well-aligned to facilitate completion. Students face a confusing maze of bureaucratic processes and a plethora of course and program choices, often with little guidance.⁶¹ Drawing on principles from behavioral economics, Judith Scott-Clayton argues that students who come poorly prepared for college would be more likely to complete a program with a more limited set of options and clearly defined and prescribed pathways leading toward further education and career advancement. Creating

more structured, well-aligned programs could accelerate completion by “mainstreaming” students needing remediation directly into college courses with added supports and prescribing course sequences to prevent students from taking unnecessary courses.

To date no rigorous studies have examined the cost-effectiveness of creating such programs. Some institutions have nevertheless attempted this approach based on the behavioral economics research cited above and on nonexperimental findings that students who enter a coherent program of study sooner are more likely to graduate.⁶² Their hypothesis is that redesigning programs to help students progress more quickly and take fewer courses that do not count toward a degree will decrease cost per completion and thus increase efficiency.

Studies of organizations both inside and outside of higher education signal that the major changes in practice and culture involved in such systemic reforms require close faculty and staff involvement.⁶³ Broad-access institutions cannot easily engage faculty in major change efforts, in part because many work part time and may have little time beyond their teaching to participate in such college activities. Studies provide little guidance on how to engage part-time faculty and other personnel in reforms, making this an issue ripe for further research.

Policy Incentives for Institutional Improvement

Substantially improving postsecondary productivity and efficiency will likely require fundamental changes in the organization and culture of broad-access institutions. Leading such an effort is difficult and risky for college leaders because of uncertainty over whether it will succeed. Although some institutions

and state systems have undertaken initiatives to improve productivity on their own, other colleges and universities may need outside pressure and incentives to do so. Because public two- and four-year institutions are funded primarily based on enrollment, they have few incentives to improve completion rates except insofar as it helps in recruitment. Policy makers therefore have few direct levers for improving outcomes such as degree completion.

There is some evidence that market mechanisms will also be insufficient to motivate broad-access institutions to improve. Compared with their middle- and high-income peers, low-income students lack access to advising and information that can help them prepare for college and make well-informed decisions about which college to attend.⁶⁴ They are thus more likely to confine their college search to broad-access institutions even if their academic performance qualifies them to attend more selective colleges.⁶⁵ They are also more likely to choose a college close to home. Indeed, proximity to college is known to affect students' decision to attend college.⁶⁶ At least two studies find that, controlling for student background, proximity to college has a greater effect on college enrollment for children of less-educated parents than for other children.⁶⁷ Because broad-access institutions already enroll the majority of undergraduates, it is unclear whether most students have any real alternative to the college they attend, because they are often choosing between attending a broad-access institution or not going to college at all.

Spurred to improve college completion while limiting college costs, state and federal policy makers are exploring new approaches to motivating colleges to improve performance.

State Performance Funding

State lawmakers determined to get the most out of every tax dollar have used performance funding as one tool to improve postsecondary institutional outcomes. Performance funding differs from traditional enrollment-based funding in that it shifts the basis of funding from educational inputs to outputs that reflect state priorities. Specifically, some states fund colleges and universities based not on how many students they enroll, but at least in part on how many they graduate, transfer, or place in jobs. Performance funding policies are often linked with efforts to make transparent and comparable measures of college performance more readily available to the public. Tennessee was the first state to adopt performance funding and reporting policies for higher education in 1979. Since then twenty-five states, including Ohio and Washington, have adopted such policies in an

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attempt to increase the performance of public institutions, although some have since revised or dropped their policies.⁶⁸

There are at least three theories about why performance funding might motivate colleges to improve outcomes.⁶⁹ One is that such funding spurs colleges to improve performance to gain increased funding in much the way the profit motive drives private businesses. A second theory is that performance funding improves institutional performance by increasing colleges' awareness of the state's higher education priorities and their awareness of their own performance with respect to these priorities. A third is that such policies increase competition among colleges and capitalize on their desire to rank well against their peers.

To date, most research on performance funding has been qualitative in nature. Findings suggest that performance funding incentives for colleges and universities have fallen short of their goals.⁷⁰ Interviews with college leaders provide some evidence that performance funding helps to raise awareness about state priorities among educators but little evidence that it has led to any substantial changes in institutional practice or effectiveness.⁷¹ Although the policies may have increased top administrators' attention to their institution's performance, the heightened attention has not translated into the systemic reforms in instruction or student services necessary to improve student learning and completion substantially.⁷²

Policy researchers have advanced a variety of explanations for the shortfall.⁷³ One is that performance funding policies have sometimes been designed with little involvement by college educators, who may not embrace the definitions of performance reflected

in the chosen metrics. Policies that reward completion alone are especially unpopular with educators at broad-access institutions, who fear that such policies would encourage broad-access institutions to turn away from their historic mission to serve underprepared students who are less likely to succeed and therefore more costly to serve.

In 2006, the Washington State Board for Community and Technical Colleges adopted a performance funding policy that attempted to address this shortcoming by rewarding colleges for increasing the rate at which students achieve key intermediate milestones across the full spectrum of students' pathways through college, including those who enter needing remediation.⁷⁴ Students reaching those milestones—completing a college-level math course, for example, or earning a specified number of college credits in a given program—are known to be more likely to complete a degree or credential. Other states have adopted or are considering adopting similar performance funding measures for community colleges.

Another reason for the limited effects of performance funding policies on institutional practice and performance is that they have often been financially unstable and unsustainable.⁷⁵ Proposals to carve performance funding from college base budgets are generally met with stiff political resistance. But funding systems that rely on "new" bonus money often fall victim to budget cuts as institutions fight to protect their base budgets at the expense of special funding streams.⁷⁶ Such struggles make it difficult for administrators to plan and execute initiatives intended to improve performance. If the policies are to work as intended, performance incentives must be predictable and sustainable over the long term.⁷⁷

Perhaps the most important reason performance funding has fallen short of expectations is inadequate investment in it. In interviews, college leaders frequently say that the funding at stake has generally been too small to motivate institutions to change.⁷⁸ The share of state appropriations tied to performance funding has generally been less than 5 percent.⁷⁹ As a result, some states have recently begun to consider allocating larger shares of the total appropriations by institutional performance. By 2014, Ohio, Indiana, Louisiana, and Tennessee will each tie at least 20 percent of their appropriations to outcomes.⁸⁰ Tennessee will lead the way with 80 percent of unrestricted state appropriations (which translates into approximately about a quarter to a half of the operating budgets of public two- and four-year colleges in the state) based on student outcomes.

The Tennessee program represents a fundamental shift in the focus of higher education funding formulas from enrollments to persistence and completion. The state will monitor performance by examining such outcomes as student credit accumulation, remedial and developmental success, transfers with at least twelve credit hours, degrees awarded, six-year graduation rates, and job placement. In addition, institutions would be eligible for a 40 percent bonus for credit and degree completion for low-income students and adult learners.⁸¹ The policies in Tennessee, Indiana, and other states will be closely watched to see if they have the intended impact on institutional behavior—and, if so, how much funding is necessary to motivate institutions to undertake fundamental changes in practice that research suggests are needed to improve performance.

Federal Performance Incentives

Perhaps because of the popularity of performance incentives among states, the federal government has also explored their use. For example, in 2012, the Obama administration proposed a series of postsecondary policies, including “Race to the Top for College Affordability and Completion,” designed to reward colleges for being more affordable, effective, and consumer-friendly.⁸² The key postsecondary policy lever for the federal government is the financial aid, including Perkins loans, work-study funds, and supplemental grants for low-income students, that it gives directly to institutions. Changes made in 2011 to federal regulations governing eligibility for Pell grants, such as the more rigorous definition of “satisfactory academic progress,” may also encourage colleges to push students to complete college programs more quickly. Based on states’ experience with performance incentives, the success of the federal policies may depend on the amount and predictability of the funding available and on how well the performance measures are aligned with the mission and goals of the institutions they are designed to motivate.

Conclusion

Achieving national goals for college completion in a time of scarce resources will require efforts to improve productivity and efficiency in the institutions that enroll the majority of undergraduates: broad-access public colleges and universities.

Measuring productivity and efficiency in higher education is complicated. To measure productivity, it is necessary to collect data on the inputs of higher education—not only faculty and staff labor but also student ability and effort. This is a daunting task. Efficiency or unit cost is somewhat easier to measure

than productivity. Unit costs appear to have declined in community colleges and to have risen more slowly in broad-access public universities than in other postsecondary institutions. The likely explanation is that because tuition increases conflict with these institutions' broad-access mission, they have sought to reduce spending rather than raise tuition unduly to make up for cuts in state and local funding.

Research indicates that the strategies broad-access institutions have relied on in the past to cut costs—in particular, the use of part-time instructors and increased student-faculty ratios—may in fact reduce productivity and efficiency. What is more, the little evidence available suggests that some of the most popular strategies for improving college success are not cost-effective. New strategies to cut costs and improve college success are therefore imperative. Research on the effectiveness of both college remediation and online learning is mixed, with some studies finding positive effects for certain groups of students and others finding none. Thus it is premature to say whether such strategies lead to greater productivity or efficiency.

Although many policy makers believe that redesigning courses to make use of instructional technologies will lead to better outcomes at lower cost, evidence on that strategy too is mixed (see the article on e-learning by Bradford Bell and Jessica Federman in this issue).⁸³ Moreover, research on organizational effectiveness in and outside of higher education indicates that colleges whose goal is to improve *program* completion without harming quality and increasing costs must go beyond redesigning courses and instead change the way they organize and manage programs and support services along the student's "pathway" through college.

Studies of community colleges in particular suggest that they might be able to improve productivity by creating more structured and prescribed programs of study. Through initiatives such as the Gates Foundation-funded Completion by Design, a growing number of community colleges have begun to test this hypothesis. These colleges are creating more clearly defined and prescribed programs and aligning them with requirements for further education and employment. They are also building "on ramps" to help students choose a program of study and customizing instruction in foundation skills to students' chosen program. Longitudinal student record data and department cost data make it possible to measure the costs incurred as students progress along their pathways through college. Such data also make it possible to calculate the cost per completion for students in particular groups, giving colleges a tool for measuring the effect on unit cost of efforts to systemically redesign programs and services. The cost of implementing these reforms is not yet known, however; even if they do improve productivity, they might not lead to lower cost per completion.

Because the prevailing enrollment-based approach to funding offers little incentive for public postsecondary institutions to make major changes in practice and culture, policy makers in many states have enacted policies that tie funding to performance. Studies suggest that such policies have had little impact on college practice to date, perhaps in part because, until recently, they have been meagerly funded. By 2014, four states will tie at least 20 percent of their state appropriations for undergraduate education to outcomes. If sustained, these efforts will make it possible to learn whether and how much performance funding can change college practices.

As policy makers push colleges to lower the cost per graduate, they must take care to avoid unintended consequences. Cutting costs without measuring the quality of the credentials produced risks giving colleges incentives to lower program standards or to curtail programs such as nursing, for which there is strong labor market demand but which are costly to offer.

As yet, there are no commonly accepted methods for measuring quality of outcomes in higher education, even within particular sectors. As the 2012 National Research Council panel on productivity in higher education concluded, efforts to develop measures of quality that can be compared across institutions are likely to be long in coming to fruition.

In the meantime, policy makers and institutions could advance the discussion of quality by stepping up efforts to measure the economic returns to credentials. As noted, research on the returns to college credentials has begun to take advantage of state data that link student educational records to labor market outcomes using Unemployment Insurance wage records. These studies make it possible to look at the outcomes of specific institutions and even particular programs within those institutions. Colleges in states where such data are not available might be able to rely on more general research on the returns to particular types of credentials in specific fields as proxies for their quality.

Although studies of the returns to education do not measure what students are learning, they do gauge the economic value of the education students are receiving and the credentials they earn. Such a quality measure is meaningful to students, policy makers, and the public and, indeed, can be

used to calculate the return on the investment in higher education by students and by taxpayers. Efforts to measure the returns to a college education should not be confined to employment outcomes, but should also examine students' success in pursuing further education. Preparing students to move to and succeed in education at the next level not only helps to further student learning, but also has economic value both for students and for the public. It is now possible to follow students as they move from one postsecondary institution to another, thanks to databases such as the National Student Clearinghouse, which tracks student enrollment and credentials earned. Such information can be supplemented by transcript-level data for students in public systems maintained by many states.

Although labor market returns and further education outcomes are valuable metrics, they are not by themselves adequate measures of the quality of a college education. Colleges and universities must continue and even redouble efforts to define learning outcomes and measure student mastery. Such data would be useful to let students and other stakeholders know what students are learning and to help faculty determine how to improve instruction. At the same time, measuring labor market returns and further education outcomes can go far to help address the expectations of policy makers and taxpayers that the public and private investment in higher education is worthwhile and can help demonstrate that efforts to raise completion rates and reduce the cost of completion are succeeding without sacrificing quality. This in turn might give space to college educators to achieve their goal of ensuring that students not only complete programs in a cost-effective way, but are learning in the process.

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