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## Challenges and Opportunities for Improving Community College Student Success

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*Many of the democratizing opportunities provided by community colleges are diminished in the eyes of policy makers by inadequate rates of success. In particular, large proportions of students who enter community colleges do not persist for longer than a semester, complete a program, or attain a credential. This review critically examines academic and policy research in search of explanations, emphasizing what is known about challenges stemming from three levels of influence: the macro-level opportunity structure; institutional practices; and the social, economic, and academic attributes students bring to college. It provides examples of how factors operating at each level affect rates of success at key times, including the initial transition to college, the experience of remedial education, and persistence through credit-bearing coursework. The article also discusses potential and ongoing reforms that could increase rates of community college success by addressing one or more areas of influence (the macro, the institutional, or the individual). It is concluded that increasing success in the open-access, public 2-year sector requires reforms directed at multiple levels and cannot be achieved with either student- or institution-focused incentives alone.*

**KEYWORDS:** community colleges, social stratification, educational reform

The massive expansion of the community college over the last century substantially increased participation in American higher education, particularly among individuals with limited opportunities for education beyond high school because of academic difficulties, financial constraints, and other factors. But strides in increasing access have not met with much success in terms of matching students to credentials; in fact, efforts to broaden opportunities may have hindered efforts to increase completion rates. A substantial proportion of students attending public 2-year colleges enroll with the intention to earn credentials yet make little progress toward a certificate or degree (Bailey, Leinbach, & Jenkins, 2006). For example, within 6 years of transitioning to college only slightly more than one third of community college entrants complete a credential of any kind (Calcagno, Bailey, Jenkins, Kienzl, & Leinbach, 2006).

Furthermore, although the open-door policy that community colleges embrace is intended to democratize opportunities, completion remains correlated with

socioeconomic advantage (McIntosh & Rouse, 2009). In fact, individuals from middle-class backgrounds may incur the greatest benefits from the community college and in particular its transfer function (Dougherty, 1994; Leigh & Gill, 2003; Rouse, 1995, 1998).

This review examines studies from social science, education, and policy over the last 25 years that identify contributors to community college success. The conceptual approach taken emphasizes the intertwining roles of three levels of influence: the macro-level opportunity structure; institutional practices; and the social, economic, and academic attributes students bring to college. The purpose is to clarify the multiple sources of difficulties that community colleges face before deciding on solutions.

Although practitioners often attribute poor completion rates to the numerous “deficiencies” that students bring to community college, this review shows that policies affecting the capacity of community colleges to serve students are also important. Crafting more effective responses requires reforms at multiple levels and cannot be achieved with either student- or institution-focused incentives alone. Several promising practices with empirical support are described, and the review concludes by identifying several areas for future research with the potential to increase the field’s scope and utility.

### **Measuring Community College Student Success**

Community colleges are highly regarded for their open admissions policy, which expands opportunities to everyone, regardless of prior advantages or disadvantages. Working learners are welcomed—more than half of 2-year college students are employed, compared with only 37% of 4-year college students. Because prior academic success is not a prerequisite for admission, 61% of students at community colleges take at least one remedial course while in college, and 25% take two or more remedial courses. This means that community college faculty members often take on the hard but necessary task of meeting students where they are and helping to move them to the next academic level (McIntosh & Rouse, 2009; U.S. Department of Education 2008).

This “second-chance” policy serves an essential function in a country where substantial numbers of poor and minority students leave high school without a diploma and even more often without developing strong writing, reading, and math skills. Many of these students focus their college search process on community colleges, constructing a decision between attending that institution or not attending college at all (Roderick, Nagaoka, & Coca, 2009). Fully 58% of all African-American undergraduates and 66% of all Hispanic undergraduates are enrolled in community colleges (Katsinas & Tollefson, 2009). As a result, “there are, for example, more low-income African American and Hispanic students at Bronx Community College alone than there are in the entire Ivy League” (Bailey & Jenkins, 2009). That diversity in both the student population and institutional missions creates challenges for creating and measuring success.

#### *Establishing a Baseline*

Open-access institutions are nonselective by definition. This means that students enter with a wide range of goals and expectations, making assessment (and particularly benchmarking) of their outcomes complicated. For example, if success is

based on the outcomes of all entrants, performance will be depressed unless success is very broadly defined. By the same token, measuring success only for a select group (e.g., those who indicate degree intentions or achieve credit thresholds) may produce a falsely positive appearance of success while also encouraging access to diminish (e.g., through creaming). Results vary depending on how broadly the pool of potential completers is defined and how success is measured (Adelman, 2005; Bailey et al., 2006; Bradburn, Hearst, & Peng, 2003; Burke, 2004; Dougherty, Hare, & Natow, 2009).

Therefore, descriptions of success in the community college sector must carefully define its terms and conditions and recognize the implications of metrics (American Association of Community Colleges, 2009; Dougherty et al., 2009). However, those caveats do not ameliorate the need to assess success, particularly given a climate of scarce fiscal resources and a push to increase the nation's stock of human capital (Adelman & Carey, 2009; Hebel, 2009). Those desires for degree completion are echoed in the individuals who enroll at community colleges. Trends in college aspirations indicate a strong presence of a college-going culture in American high schools, with nearly all high school seniors reporting intentions of earning college degrees (Roderick, Nagaoka, & Allensworth, 2006). Ninety percent of high school students indicate that they expect to attend college, even if their career choice does not require it (Schneider and Stevenson, 1999). Compared with the 1970s, 12th graders in 2000 were twice as likely to anticipate earning a bachelor's degree in addition to a 2-year degree (Reynolds, Stewart, MacDonald, & Sischo, 2006). Rates of long-term expectations for earning bachelor's degrees are similarly high among entering community college students, with 70% expecting to earn a bachelor's degree or higher (Bailey et al., 2006).

When they first enroll, community college students report a mix of short-term motivations primarily based on practical considerations and personal enrichment. When not restricted to offer a single reason for attending, 46% report enrolling for personal interest and 42% report seeking job skills. Roughly the same percentage indicate that they are enrolled to earn an associate degree, and 17% want a certificate (Horn & Nevill, 2006). Notably, desires for job skills or personal enrichment do not preclude degree intentions—nearly 80% of students across those two groups expect to earn a credential (Bailey, Jenkins, & Leinbach, 2006). Over one-third of community college students report that they enroll in order to transfer to a 4-year college (Horn & Nevill, 2006).

At the same time, one function of education is to increase students' ambitions for further education, and therefore college attendance itself may enhance educational expectations. One simple measure of success is whether students increase (or decrease) their educational expectations after entering community college. In contrast to a longstanding hypothesis that community college students incur diminished aspirations over time in a process of "cooling out" (Clark, 1960), there is mounting evidence that students' already-high aspirations swell during college in a process some have termed "warming up" (Alexander, Bozick, & Entwisle, 2008). In contrast, there is little support for the idea that students level or reduce their expectations in response to feedback about their academic abilities or planned occupational requirements or as a result of attending community college (Rosenbaum, Deil-Amen, & Person, 2006).

Therefore, conditioning rates of success based on initial measures of expectations or primary reasons for enrollment may be problematic (Bailey et al., 2006). Given that intended outcomes vary over time, some observers suggest that community college success is more appropriately measured with intermediate indicators or “milestones” (Calcagno, Crosta, Bailey, & Jenkins, 2006; Moore, Shulock, & Offenstein, 2009). For example, progress can be assessed based on the completion of course credits (either remedial or nonremedial credits), the percentage of a program completed, or whether a student passes the initial college-level or degree-credit “gateway” courses in writing and mathematics. This approach credits incremental progress and takes into account wide variation in student pathways.

#### *Average Rates of Success*

Even with the caveats mentioned here, progress through community college is generally slow, no matter how it is measured. The evidence is clear—among students with stated degree intentions, rates of dropout are high (Bailey et al., 2006). After 3 years just 16% of first-time community college students who began college in 2003 attained a credential of any kind (certificate, associate’s degree, and/or bachelor’s degree), and another 40% were still enrolled. When students are given 6 years to complete instead of 3, completion rates improve somewhat—for example, 36% of students entering community colleges in 1995 attained a credential by 2001. Moreover, another 17.5% were still enrolled. Although this indicates that completion rates need to account for the pace of progress toward completion, the noncompletion rate (no degree, not enrolled) hovers very close to 50%—even given longer time horizons. Of course, this number decreases when degree completion is measured over a longer period of time (Attewell & Lavin, 2007), but in the aggregate it represents a substantial loss of human capital and resources.

### **Reviewing the Challenges and Opportunities**

What stands in the way of increasing credential attainment among community college students? In pursuit of answers, this review examines 25 years of academic and policy research on community college student persistence.

#### *Methodological Approach*

Articles were identified with a search of the Educational Resources Information Center, Education Full Text, and Social Sciences Abstracts using combinations of keywords (community college student, 2-year student, degree completion, persistence, momentum, and barriers), resulting in the location of 2,200 studies published since 1985. Reference lists of relevant books, articles, and reports from this literature, as well as conference proceedings and dissertation abstracts, were consulted. To include relevant nonacademic work, the Google search engine was used, and publication listings of major nonprofit organizations funding or conducting research on community colleges (e.g., MDRC, Jobs for the Future, RAND, the Lumina Foundation) were examined. The author also corresponded with researchers at the Community College Research Center in New York to inquire as to unpublished research, and several reviewed the list of studies to be included and suggested additions.

After the more than 3,000 studies produced by that search were culled to identify those which dealt with independent data sets, the resulting list of approximately

750 studies were filtered according to two criteria: (1) They used quantitative or qualitative methods that could rigorously address the research questions, and (2) quantitative studies needed to produce findings that could reasonably be generalized beyond the sample to the larger population of community college students. Rigorous research was defined as using sufficient and appropriate data to address the research question and following a research design that made it possible to answer the questions posed. For example, for studies addressing questions of “what works” or program effectiveness, the research had to be designed appropriately to satisfactorily rule out competing explanations, providing grounds for causal inference. For studies examining mechanisms or pathways promoting college success (e.g., interviewing studies), the approach to sampling and data collection had to be transparent and defensible. Studies meeting those criteria were included in the final review ( $n = 300$ ; some are not reflected in the reference list because of space constraints).

### *Analytic Approach*

For the purposes of analysis, studies were grouped into those focusing on (a) the macro-level opportunity structure; (b) institutional practices; and (c) the social, economic, and academic attributes students bring to college. Particular attention was paid to studies that discuss the relationships and interactions between individuals and institutions, institutions and policy settings, or some combination of the three.

A multilevel conceptual model was used for several reasons. First, this approach draws attention to the structural constraints governing individual decision-making. Absent sufficient consideration of structure, many studies (and policies) target individuals' choices as if they are unconstrained. As Hearn (2006) notes, it is not uncommon for models of student success to neglect key relationships between societal structure and stratification processes, state and federal politics, policy implementation, and student outcomes. This review begins to remedy that problem. Second, this approach emphasizes the breadth of ways policy makers could address the same outcome, opening up possibilities for creative solutions. Third, this frame builds on that of several other contemporary researchers, including those involved in the National Postsecondary Education Cooperative's initiative on college student success (e.g., Hearn, 2006; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006; Perna, 2006; Perna & Thomas, 2006, forthcoming). At the same time, it extends that work by focusing on factors affecting community college success in particular.

### **The Opportunity Structure Affecting Community College Success**

An opportunity structure denotes those exogenous factors either limiting or facilitating the work of community colleges and the success of their students. Its existence may reflect our societal need for status hierarchies, playing an important role in preserving our culture (Yankelovich, 1991). Through political and financial decisions, politics, and practices, we maintain a social order that constrains the educational opportunities of some and promote those of others.

The community college itself is sometimes cast as an actor in a differentiated opportunity structure that legitimates inequality (Brint and Karabel, 1989). One of the most robust streams of literature centers on the question of whether community

colleges provide a democratizing or diversionary influence on students. Over the last three decades, dozens of empirical studies conducted by sociologists and economists have generally concluded (with a few exceptions) that the positive, “democratizing” effect of community college slightly outweighs the negative, “diversionary” influence of drawing students away from baccalaureate-granting colleges (e.g., Alba & Lavin, 1981; Alfonso, 2006; Anderson, 1981; Breneman & Nelson, 1981; Doyle, 2008; Dougherty, 1987; Hilmer, 1997, 2000; Leigh & Gill, 2003; Long & Kurlaender, 2008; Melguizo, 2009; Reynolds, 2006; Reynolds & DesJardins, 2009; Rouse 1995, 1998; Stephan, Rosenbaum, & Person, 2009; Velez, 1985). These effects are the result of how the institutional actor (the community college) functions while structurally subordinated to multiple entities—government, business, and 4-year colleges. Its actions are constrained by each of these forces (Kyvik, 2008).

At the same time, the role of snobbery in perpetuating community college outcomes is often neglected. Since the founding of the public 2-year sector, many have cast this sector as lesser than its counterparts. For example, although during the early decades of the formation of community colleges, the media primarily reported positively on their speedy growth (DeGenaro, 2006), others had already begun to lament their existence. Writing in *Educational Record* in 1968, W. B. Devall described community colleges as places that enforce “continued dependency, unrealistic aspirations, and wasted ‘general education’” (p. 169). This critique continued in the work of many researchers, particularly those studying the colleges from the outside in (Oromaner, 1984). Today, less than 2% of all national media coverage of education is devoted to community colleges (West, Whitehurst, & Dionne, 2009). Although these public perceptions, including the “rhetoric of inevitability” of poor outcomes, may be changing, the role that they play in informing and structuring decisions about the capacity of this educational sector should not be overlooked (DeGenaro, 2006).

### *Power, Governance, and Funding*

The work of community colleges is intimately connected to their position as publicly funded institutions whose origins, although widely disparate, stem primarily from the actions of local and state actors (Dougherty, 1994). In some states they developed from the desires of citizens for a nearby postsecondary institution, in other cases grew out of normal (teachers) colleges, and in still other cases were crafted by state legislatures. In all cases, they are distinctly public institutions, beholden to multiple constituents, including legislators, the business community, and families. They are often cast as a middle-ground between K-12 education and higher education. Yet as Medsker wrote in 1956, community colleges “do not conform to the established patterns of either the institutions above them or those below them” (p. 248). In fact, when movement has been in the direction away from this tight community connection (as in the movement to globalize the community college) resistance has been substantial, with critics noting that community colleges best serve the public interest by addressing problems unique to their very local environments (Hanson, 2008).

The governance and funding structures of community colleges are tightly linked, with the latter said to reflect the approaches and values of the former (Mullin & Honeyman, 2008). At the same time, the substantial heterogeneity in

how community colleges are governed also means that numerous approaches are used for financing community colleges. Since the mid-20<sup>th</sup> century, community colleges have relied on states and localities for the lion's share (nearly 60% nationally) of their revenues. In total, federal funds (including financial aid) amount to only 15% of community college revenue (Breneman and Nelson, 1981; National Center for Education Statistics, 2007). Additional support from state and local sources fails to compensate for community colleges' relative lack of federal support. Community colleges typically receive between \$6,500 and \$6,800 per full-time equivalent student annually from state and local sources (Goldrick-Rab, Harris, & Trostel, 2009).

Dependence on state and local funds makes colleges particularly susceptible to fluctuations in the economy and, thus, state and local budgets (Dowd & Cheslock, 2006; Katsinas & Tollefson 2009). This dependence also makes colleges accountable to local taxpayers and business leaders. It can drive decisions about the distribution of time and resources, such as how much effort to invest in more lucrative programming including contract training. Many community colleges are following increasingly entrepreneurial paths, in turn diminishing the power of state governing structures (Mullin & Honeyman, 2008). That entrepreneurialism contributes to struggles to achieve student-focused goals while also bringing in necessary revenue.

Although it is difficult to establish a clear causal relationship between institutional expenditures and degree outcomes, some analyses indicate a positive relationship between the availability of resources per student and college degree attainment (Bound, Lovenheim, & Turner, 2009). When an increase in enrollment creates a crowding of students vying for scarce college resources, rates of degree completion tend to decline (Bound & Turner, 2007; Kurlaender, Grodsky, & Howell, 2009). This is precisely the situation faced by community colleges, which have seen increases in student demand unmatched by increases in public subsidies (Mellow & Heelan, 2008).

Research by Titus (2009) links several aspects of states' higher education finance policies to their bachelor's degree productivity. Although not specifically focused on predicting student-level outcomes at community colleges, his research does indicate the importance of these structural factors. For example, even after accounting for the endogeneity of such factors, Titus finds that the level of state appropriations for higher education and the level of spending on need-based financial aid are positively related to BA production within states. At the same time, he finds that in contrast to other research (e.g., Kienzl, Alfonso, & Melguizo, 2007), labor market conditions (e.g., the unemployment rate) are not predictive of BA production after other factors are accounted for.

It is also possible that the overall low average rates of spending on community college students may contribute to the weakness of observable relationships between spending and outcomes—because funding even at the highest level is inadequate. For example, consider remedial education, which has notoriously low rates of success. As described later in this review, the best remedial education is said to be developmental, not only equipping students to learn content but also teaching them how to succeed in college—yet few remedial courses are of this quality. A cost evaluation of a high-quality remedial program in Massachusetts, designed by a team of specialists, revealed that the costs of a high-quality remedial program greatly exceed costs of typical remedial instruction (Dowd & Ventimiglia,



2008). This evidence suggests that the quality of the typical remediation problems is relatively low and may be related to inadequate funding—and that more extensive and expensive, high-quality programs could have a positive impact.

### *Goals and Incentives*

The actions of community colleges and their students are also framed by an emphasis on college-going rather than college completion. Since the mid-20th century, governments and philanthropies have played an active role in promoting access to higher education but until recently most paid far less attention to whether students finish college. This emphasis is reflected in how community colleges are funded. Funding formulas tend to be based on enrollment. This approach rewards colleges for getting students in the door but not for making sure those students succeed. In theory, students would seek out colleges and programs where other students have had success in finishing degrees, transferring to 4-year colleges, and getting jobs—and those same colleges and programs would compete against one another to attract students. But in practice, students lack information about college performance, and competition is limited because most campuses serve a primarily local population (rather than a statewide or national population as in the case of 4-year colleges and universities). The method by which most community colleges are funded thus provides little incentive for institutions to focus on improving the quality of outcomes for their students. For example, among the mix of federal funds and programs dedicated to the community college sector, very few aim to improve institutional performance (Goldrick-Rab, Harris, & Trostel, 2009).

### *Financial Aid*

Student financial aid is the single largest investment governments make in community colleges. Yet many of the rules and guidelines governing the distribution of aid make it difficult for community college students to access and keep their financial aid. For example, although part-time enrollment may reflect a student's need to earn money to afford college (and many community college students enroll part-time), it simultaneously reduces aid eligibility. Students enrolled less than half time are ineligible for any form of aid, and earnings from work are absorbed quickly (especially for independent students) under the federal formula (Goldrick-Rab & Roksa, 2008; Lapovsky, 2008). In one study of low-income workers in six different community colleges, participants reported concerns about the forgone wages associated with reduced work when going to school, being rendered ineligible for financial aid because of having a working spouse, and not knowing enough about their financial aid opportunities or even the existence of financial aid (Matus-Grossman, Gooden, Wavelet, Diaz, & Seupersad, 2002).

Does a lack of financial aid affect momentum toward a degree? Clearly, students who receive financial aid may have characteristics that reduce the likelihood they will complete college (and vice versa); thus, comparing the persistence of recipients with nonrecipients will yield unsatisfactory results (Goldrick-Rab, Harris, & Trostel, 2009; Hossler et al. 2009). Quantitative analyses that have attempted to isolate effects of financial aid on persistence using nationally representative data sets have produced mixed findings, partly because of differences in statistical techniques, sample, and the time frame under study (Dowd & Coury, 2006;

Hossler et al. 2009). Recent rigorous analyses of the effects of aid on persistence reveal that students who receive financial aid appear more likely to make consistent progress in college. For example, receiving a Pell Grant appears to decrease the probability of withdrawal among students during their first 2 years of college (Bettinger, 2004). Conversely, Dowd and Coury (2006) found that loans had no effect on degree completion when they are taken out by community college students in the first year and had negative effects on persistence. Furthermore, grants and work study had no significant effects. But aid may represent more to students than money. A study by DesJardins, Ahlburg, and McCall (2002) indicates that both the type of aid and the timing of aid may affect student retention; for example, scholarships given earlier during college appear to be more effective at preventing stopout. Overall, reviews of the effects of traditional need-based grants indicate that they hold promise for promoting persistence among community college students (Mundel, 2008).

### *Institutional Differentiation*

The requirement that community college students move institutions in order to complete a bachelor's degree introduces another potential structural barrier to student success. Although institutional differentiation arguably expands opportunities by increasing the number of slots available in postsecondary education, it may also restrict opportunities if transfer across schools is difficult (Shavit, Arum, & Gamoran, 2007). This is the case in the United States, where the system does not facilitate the equitable flow of all students among all schools. Some students who change schools lose a portion of the credits they earned at the last institution they attended, fail to piece together a coherent curriculum of courses, and struggle to find the means with which to pay for college and travel to school (Bailey, 2003; McCormick, 2003; Prager, 2001).

Studies that compare the outcomes of students who successfully transfer from community to 4-year colleges with students who begin at 4-year colleges and rise to junior year status provide some of the strongest evidence that institutional differentiation (put another way, the need to transfer) is itself a prime barrier to degree completion. One particularly rigorous analysis (which includes corrections for differences in how students initially select into college) finds that the type of first college attended does not contribute to disparities in bachelor's degree completion rates among low students of low socioeconomic statuses—after the initial transfer is accounted for (Melguizo & Dowd, 2009). The findings support the idea that reducing structural barriers between the 2- and 4-year sectors may cause completion rates among community college entrants to rise.

A related issue is the ability of policy makers to track the progress of students across colleges and universities in order to examine progress and assess program and policy effectiveness. Student-unit record data allow for individual outcomes to be tracked across institutions and for educational employment outcomes to be linked. Most states do not have the requisite data systems to link K-12 and postsecondary education or to link across sectors within postsecondary education. This severely limits the potential for states to refocus community college on outcomes, measure the cost-effectiveness of institutional practices, or identify key areas for reform (Data Quality Campaign, 2008; L'Orange & Ewell, 2006).

### *Interactions between Social and Educational Policymaking*

Community college student success is affected not only by policies that are explicitly intended to influence educational outcomes in particular but also by social policies. For example, for much of the latter half of the 20th century, one route to college access for women in poverty with children was through the welfare system. Under the federal program Aid to Families with Dependent Children (AFDC), some welfare recipients received free tuition and child care so that they might attend college. Following the passage of the 1996 Personal Responsibility Work Opportunity and Reconciliation Act (PRWORA), which put recipients directly into work, there were significant declines in the number of poor women allowed access to college via this route (Shaw, Goldrick-Rab, Mazzeo, & Jacobs, 2006). Poor women (and poor men) were also affected by the 1998 Workforce Investment Act (WIA), a workforce development policy that sharply curbed access to job training. Whereas under the Job Training and Partnership Act, community colleges across the country enrolled thousands of low-income adults in both long-term and short-term training programs, those numbers dropped dramatically under WIA. Moreover, the federal welfare reform and WIA worked in tandem to reduce the incentives for community colleges to develop and provide programs for the truly poor, via the development of an accountability regime that increased paperwork and decreased funding. Thus, today it is harder than ever for the poorest adults to find ways to afford attendance at community college, and to find support if they do enroll.

### **Institutional Practices Affecting Community College Success**

Most interventions intended to generate reform and improvement are targeted at colleges and universities. This section considers research evidence as to the relationship between different kinds of institutional practices and student outcomes.

#### *Access to Credit-Bearing Coursework*

A lack of academic preparation does not preclude community college enrollment, but it does affect the transition to college credit-bearing coursework. The practice of separating noncredit basic skills instruction from the provision of academic college coursework is common and affects large numbers of students (Jacobs & Tolbert-Bynum, 2008; Van Noy, Jacobs, Korey, Bailey, & Hughes, 2008). Many are older adults from disadvantaged backgrounds, who often enter higher education with low levels of literacy. Nationally, 57% of 2-year institutions rank the academic preparation of their entering students as fair or poor (El-Khawas & Knopp, 1996; Lewis, Farris, & Greene, 1996). For students who did not complete a high school diploma, some period of enrollment in Adult Basic Education (ABE) coursework is necessary prior to enrollment in the most fundamental college-entry courses.

There has been a shift in recent decades toward providing ABE in community colleges rather than the K-12 sector (Duke & Strawn, 2008; Jacobs & Tolbert-Bynum, 2008; Morest, 2004). Most empirical studies find that ABE programs are of low quality and have little economic or educational impact in terms of helping students move on to college-level work (D'Amico, 1997; Pauly & DiMeo, 1996). For example, in a study of students in Washington State's community and technical

colleges, Prince and Jenkins (2005) found that only 13% of adults who started in ESL programs earned any college credits during the next 5 years, and only 30% of students in ABE and GED programs transitioned to college-credit courses during that time. Other studies show that half of all ABE students drop out in less than 10 weeks, and only a small proportion of GED students who earn that credential then go on to college-level coursework (Alamprese, 2005; Jobs for the Future, 2004). As a result, ABE classrooms often experience “attendance turbulence,” impelling some administrators to use an open-entry/open-exit system via which adult learners can come and go (Sticht, MacDonald, Erickson, 1998; Strucker 2006). It is unsurprising that an analysis of the results of 22 of the most credible outcome studies in adult education found that only 5 identified earnings gains and 4 identified student test scores gains (Beder, 1999).

Although research suggests that economic and personal factors mediate the relationship between basic education and adult outcomes (D’Amico, 1999), there is also evidence that institutional practices matter for the quality of ABE. In particular, links between ABE and further educational opportunities and to employers are also vital aspects of program quality; traditionally, adult basic education programs have weak or nonexistent links with advanced certificate and degree programs (Alamprese, 2005; Jacobs & Tolbert-Bynum, 2008). As Jacobs and Tolbert-Bynum put it, “Currently, the lack of a relationship between ABE and degree-granting activities means that ABE is often insufficiently interesting to students to serve as an enticement for continuing enrollment in college ... even students who are interested in pursuing a college degree do not know how to do so” (2008, p. 5).

These issues also affect high school graduates in need of additional skills development. Given that students bound for community colleges are less likely to take and succeed in rigorous courses while in secondary school, it is predictable that for more than two-fifths of entering community college students the first year is characterized by participation in remedial education (National Center for Education Statistics, 2003). Most community college students (90%) spend a year or less in remediation, and they are most often engaged in remedial math courses rather than writing or reading. Students who require remedial coursework appear less likely to complete any type of credential at a community college (Bailey, Calcagno, Jenkins, Leinbach, & Kienzl, 2005).

The debates surrounding remedial education are extensive and include whether remedial coursework should be integrated with credit-bearing coursework to increase its quality and effectiveness and, relatedly, where (e.g., at a 2-year vs. a 4-year college) it should be offered (Shaw, 1997; Zeitlin & Markus, 1996). Another question often asked is whether high rates of remediation stem from institutional disjunctures between K-12 and postsecondary education, such as a misalignment of coursework and expectations. At the heart of these debates is a critical question: whether low rates of college completion among remedial students means that remediation has deleterious effects on student progress (Bailey, 2009). It is not an easy question to answer, because students who take remedial coursework differ in both observable and unobservable ways from students who do not. Analysts must therefore take care to distinguish the process of selection into remediation from any effects of remediation on later outcomes.

Some recent rigorous studies of remedial education in community colleges have found short-term positive effects on student persistence (Attewell, Lavin, Domina, & Levey, 2006; Bettinger & Long, 2005; Calcagno & Long, 2008; Jepsen 2006; Moss & Yeaton, 2006), whereas other rigorous studies find no impacts on degree completion (Calcagno & Long, 2008; Martorell & McFarlin 2007). This means that even though students in remediation are less likely to complete college degrees, that may not be attributable to remedial education itself. The impact also appears to vary by the type of remedial coursework taken, although the findings are inconsistent in this regard. In one study the effects were notably larger for remedial coursework in reading and writing when compared with the effects of math coursework (Attewell et al., 2006), but other studies have found positive effects of math remediation, whereas the results for English remediation suggested no conclusive positive or negative impact on students (Bettinger & Long, 2005; Kolajo, 2004).

Some of the strongest evidence that institutional practices regarding academic coursework affect student success comes from two studies indicating that certain courses act as “gatekeepers” to college completion (Calcagno et al., 2006; Roksa, Jenkins, Jaggars, Zeidenberg, & Cho, 2009). Passing gatekeeper math and writing courses enables access to higher level coursework, significantly contributing to student progress. That relationship appears to hold even after accounting for differences in students taking and not taking gatekeeper courses. For example, a study in Florida found that among comparable students in remedial writing courses, those who passed the first-year composition course were more than twice as likely to graduate when compared with those who did not pass that course (Calcagno et al., 2006). A study of Virginia community college students showed that gatekeeper courses appear to offer similar benefits in that state (Roksa et al., 2009). And yet many students fail to take any gatekeeper courses at all. The low rates of gatekeeper course enrollment among academically well-prepared Virginia community college students in particular suggest that institutional factors are likely contributing to this problem (Jenkins, Jaggars, & Roksa, 2009).

### *Pedagogical Practices*

The content and quality of instruction in the community college sector is widely debated (Perin, 2001). Part of the challenge stems from heterogeneity among students. In addition, there is general consensus that instruction for adults needs to integrate curricular content with practical applications, particularly in entry-level courses (Badway & Grubb, 1997; Perin, 2001). However, such “contextualized” teaching and learning strategies are relatively uncommon. For example, Pauly and DiMeo (1996) found that only 16% of the adult basic education programs that they studied made any effort to link basic education and the world of work. In a 1994 survey of 75 remediation and basic skills providers, only 2 providers reported that they linked curriculum with vocational skills training (Grubb & Kalman, 1994). Instead, texts and content were separated from context in what Grubb calls the “skills and drills” approach (1996, p. 72). Similarly, a study of 271 adult literacy programs revealed that 203 used instructional strategies and materials that were devoid of strong connections to the life-context and real-world situations learners faced, including the workplace (Purcell-Gates, Degener, & Jacobsen, 1998).

Although research has linked levels of instruction spending to community college outcomes, community colleges often lack the resources to support innovative practices or to fund the developmental costs for new and innovative teaching approaches (Bailey, Jenkins, & Leinbach, T., 2005). There are some competitive grant programs that support innovation in higher education, such as the Fund for the Improvement of Postsecondary Education (FIPSE), but these grants have historically been small in size and scope and rarely used strategically (Goldrick-Rab, Harris, & Trostel, 2009).

A related issue is the need for technological improvements to classrooms that must accompany innovative teaching practices. A recent survey of community college leaders revealed that all four of the most pressing facilities needs are instruction-related—those related to lab space, general classroom space, computer lab space, and office space (Katsinas & Tollefson, 2009).

### *Faculty*

Although there is a robust literature on the effects of teachers on student outcomes in the K-12 arena, among studies of community college student success the role of faculty is often neglected (for notable exceptions see Grubb, 1999; Outcalt, 2000). This seems a remarkable omission, especially given that some of the conditions under which these faculty members work, including a reliance on adjunct faculty, a lack of professional development opportunities, and shortages in key fields, have been linked (at least via correlational studies) with student outcomes (Calcagno, Bailey, Jenkins, Kienzl, & Leinbach, 2008; Brock et al., 2007).

Given limited resources available for instructional costs, it is no surprise that community colleges rely very heavily on part-time adjunct lecturers who often teach multiple courses at multiple colleges and receive low wages and no benefits (Bailey, Jenkins, & Leinbach, 2005). Some analyses identify positive effects of adjuncts on specific types of course-taking, whereas others find an overall negative effect on student persistence (for a summary, see Bettinger & Long, 2006).

Compared with professors at 4-year institutions, whose salaries include pay for time spent on activities other than teaching, community college professors have little incentive to invest in their own professional development or spend their scarce time learning how to effectively use new technology. Like professors elsewhere, community college faculty need resources for planning and curriculum development and for regular meetings to discuss teaching, refine lessons, and assess performance. Unfortunately, at many community colleges the most common forms of professional development are the kinds of one-time workshops that research shows are ineffective. Again, this problem stems in part from a lack of resources for faculty development: In many states funds for college faculty development are limited or have declined in recent years (Chancellor's Office of the California Community Colleges, 2009).

Another issue topping the list of concerns among community college administrators is a severe shortage of faculty in nursing, allied health, and Science, Technology, Engineering, and Mathematics (Hardy, Katsinas, & Bush, 2007). Teachers in these fields are in high demand, making it more difficult to attract and retain these teachers. They have numerous other job opportunities, most of which pay higher wages and offer better benefits. Shortages in such specialized fields are not new, but compounding the problem for community colleges is that two thirds of their faculty members are between the ages of 45 and 64 (Snyder, Dillow, &

Hoffman, 2008) so although hiring younger and, more importantly, less expensive faculty may be an attractive option, the pool of qualified applicants with these specific in-demand skills may be quite small.

### *Informational Requirements*

By virtue of their extensive course catalogues and numerous services, coupled with the diverse array of students they serve, community colleges provide ample opportunities but—according to some—insufficient information with which to guide students through choosing among opportunities. As a result of substantial informational requirements accompanied by too little advising, some students may take courses they do not need, spend a longer period of time in coursework that financial aid will not fund, and eventually drop out (Grubb, 2006; Rosenbaum et al., 2006).

For example, many community college students have little knowledge about course requirements and in some cases are not even aware that the classes they are taking are remedial and do not count toward a degree (Person, Rosenbaum, & Deil-Amen, 2006). This makes academic advising important to students' chances of success; one study finds that this is especially true for students with academic deficiencies (Bahr, 2008). When community colleges do not explicitly provide the information and social skills their students need, students face obstacles in finishing college and moving into the labor force (Deil-Amen, 2006).

### *Organizational Learning*

A final issue regarding institutional practices has to do with how community college administrators make decisions. In particular, there is a growing movement to encourage educators to use data to identify opportunities for improved institutional performance and enhanced student outcomes. Despite widespread interest in using data to drive decision making, researchers have identified obstacles to integrating findings from institutional research into daily practice. For example, many community colleges lack sufficient numbers of trained researchers to conduct analyses and expertly clean student-level data and organize it for research purposes (Morest & Jenkins, 2007). There is also some debate over whether data should be leveraged as part of a “culture of evidence” in which data drives decisions or a “culture of inquiry” in which practitioners take center stage (Bailey & Alfonso, 2005; Dowd, 2005). On a theoretical level, at least, helping institutional leaders view evidence of student outcomes and discuss those outcomes should facilitate improvements (Bensimon, 2004; Jenkins, 2007; Jenkins & Kerrigan, 2009; Zachry & Orr, 2009). At the same time, although establishing a culture of evidence may be a necessary condition to improving student success, it is unlikely to be sufficient, because adoption of new practices by administrators does not always follow (Jenkins & Kerrigan, 2009).

### **Social Inequalities Affecting Community College Success**

When considering the root causes of low rates of completion among community college students, many analysts begin with a discussion of student characteristics. The primary point of these efforts is to describe the substantial barriers community college students face and therefore the challenges that institutions must overcome to help students succeed in earning degrees. This emphasis is often echoed

by community college practitioners who argue that insufficient attention to the wide variation in students' preparation and educational expectations leads to misleading assessment of success and unfairly results in too much attention paid to factors outside of colleges' control (Bailey, Jenkins, & Leinbach, 2005). Therefore, in this next section I examine research on how student attributes affect the likelihood of success in the community college sector.

### *Social Inequalities and Student Characteristics*

Relative to other undergraduates, students attending the nation's 2-year public colleges come from a wider range of family backgrounds. For example, 40% of undergraduates enrolled at community colleges in 2008 were non-White, 38% came from families where neither parent was educated beyond high school, and 56% were women (in comparison, the corresponding figures for students at public 4-year institutions are 33%, 25%, and 53%).

The social and economic characteristics of community college students are often termed *demographic* (implying that they are hereditary) rather than *ascriptive* (meaning that they reflect positions in a stratification system). Correspondingly, the greater racial, socioeconomic, and gender diversity among community college goers is often treated as an explanation for institutional outcomes. But the compositional diversity of community colleges itself reflects social inequalities, which could be taken into account when we attempt to move beyond simple explanations to identify root causes. In other words, although the observation that students' characteristics are correlated with college outcomes is important, it does not tell us the mechanisms through which those relationships operate—or what we can do about it. For example, we can move beyond stating that community colleges serve more students from low socioeconomic backgrounds who are less likely to complete college and instead discuss the underlying reasons why such a relationship exists. Doing so increases the potential for acting on those underlying inequalities.

### *Academic Challenges*

One of the most widely accepted lessons from research on college success is that all students, regardless of what type of college they plan to attend, need to be academically prepared. For example, Adelman (1999, 2006) identified a “toolbox” of high school courses considered crucial for preparing a student for postsecondary participation, including those in math, science, and foreign language. Students whose high school curricula include advanced levels of these courses tend to perform better in college, even after high school grades and standardized test scores are held constant. Similarly, Roderick, Nagaoka, Coca, and Moeller (2008, 2009) point toward a set of skills required for college readiness that includes academic content knowledge and basic skills as well as core academic skills. Measures of performance on these skills (e.g., via coursework, achievement test scores, and grades) indicate their importance in predicting college outcomes and their lack of integration into the work of many high schools.

There is widespread acknowledgement that students enjoy differential access to academic preparation for college: Economically disadvantaged and minority high school students are more likely to receive secondary schooling in vocational rather than academic tracks; take fewer math and science courses; and attend schools with fewer resources, less-qualified teachers, and a lack of college prep coursework



(Cabrera, Burkum, & La Nasa, 2005; Gamoran, Porter, Smithson, & White, 1997; Nora & Rendon, 1990; Orfield, 1992; Roderick, Nagaoka, Coca, & Moeller, 2008, 2009; Terenzini, Cabrera, & Bernal, 2001). This is especially problematic given empirical evidence that the benefits of strong high school preparation are greater for socioeconomically disadvantaged students (Cabrera et al., 2005). Moreover, many community college-bound students are unaware of the need to engage in rigorous college prep coursework, partly because of the false perception that open-door institutions have no academic requirements (Schneider & Stevenson, 1999; Person et al., 2006; Rosenbaum et al., 2006). Indeed, some studies indicate a broad lack of awareness of placement testing and its consequences (Deil-Amen & Rosenbaum, 2002; Person et al., 2006). The concentration of poor and minority students in schools with other poor and/or minority students exacerbates the uneven distribution of both academic opportunities and “college knowledge,” because students with greater needs are isolated from more advantaged students (Roderick, Nagaoka, & Coca, 2009).

### *Economic Challenges*

Students also face significant challenges in figuring out how to pay for college (Hossler & Vesper, 1993; Roderick, Nagaoka, Coca, & Moeller, 2008, 2009; St. John, 1991). Affordability is an important reason why a disproportionate number of low-income and minority students do not attend college or do not complete a college degree once enrolled (Mumper, 1993; Perna, 2002). Trends in financial aid toward providing less need-based aid (and more merit-based aid) and devoting more funding to loans rather than grants have reduced the chances that college students from low-income families will enter college or complete a degree (Goldrick-Rab, Harris, & Trostel, 2009; Orfield, 1992; Perna, 1998, 2002; St. John, 1990).

Knowledge of how to pay for college is concentrated in families where at least one parent attended higher education. First-generation students are less likely to receive high-quality information about financial aid opportunities and, in turn, are less likely to apply to college or file the federal application for student aid, which is required for them to receive grants or loans (DesJardins, Ahlburg, & McCall, 2006; Roderick, Nagaoka, Coca, & Moeller, 2008, 2009). Both the quantity and quality of college financing information that families receive differ by social class: Economically advantaged students learn about college and how to pay for it from a variety of sources, whereas poor students often have to rely on their high school counselors, largely because most persons in their circle of influence (e.g., family members, close friends) did not attend college (Cabrera et al., 2005; McDonough, 1997; Roderick, Nagaoka, Coca, & Moeller, 2008, 2009). As a result, disadvantaged parents are less likely to feel they can predict the cost of college, although they do not necessarily make more errors in their cost estimates when they do provide them (Avery & Kane, 2004; Grodsky & Jones 2007). When they do occur, inaccuracies in cost estimates may discourage some students from any form of college attendance (Avery & Kane, 2004).

### *Social and Informational Hurdles*

Almost regardless of family background, the educational expectations of today's traditional-aged students are uniformly high. But expectations do not always

translate into the development of a concrete and realistic plan or commitment to a future course of behavior (Morgan, 2005; Roderick, Nagaoka, Coca, & Moeller, 2009). Students from socioeconomically disadvantaged family backgrounds are less likely to possess a clear sense of how to negotiate either the college social or academic context. As a result, when these students are confronted with multiple pathways and options (with regard to courses, programs of study, etc), they are more likely to make ineffective choices (Alfonso, 2004; Person et al., 2006; Roderick, Nagaoka, Coca, & Moeller, 2008, 2009). And there is evidence that educational choices matter. In a country where parents with greater resources tend to live in school districts with more educational opportunities, it is difficult to disentangle students' educational experiences in primary and secondary school from early familial experiences. However, comparisons among students from similar family backgrounds but with different types of high school education reveal that the quality of academic coursework and performance in that coursework are particularly strong predictors of both college entry and subsequent performance (Nora & Rendon, 1990; St. John, 1991).

Whether a student has a college-educated parent influences the kind of information about college that she accumulates in the years leading up to choosing a college (Person et al., 2006). For example, the process of college selection for Latino students (who disproportionately do not have college-educated parents) has been described as a "chain of enrollment," where friends and family members provide each other with information and support and ultimately follow one another into specific institutions (Person & Rosenbaum, 2006; Person et al., 2006; Rosenbaum et al., 2006). The jobs held by a student's parents may also create advantages or disadvantages by, for example, opening doors to easier admissions or by introducing insecurity (when the labor market cannot sustain availability of opportunities).

### *Attendance Patterns*

Many facets of students' attendance patterns have been linked to chances for college success. For example, research indicates a strong association between an undisrupted transition to college and the likelihood of degree completion, such that individuals who make a timely transition into college without a significant period of delay after high school are substantially more likely to complete a credential or degree during college (Adelman, 2006; Bozick & DeLuca, 2005; Goldrick-Rab & Han, 2010; Rowan-Kenyon, 2007). Yet 17% of high school graduates who begin college at a community college delay that initial enrollment for 8 months or more (Adelman, 2005). The ability to make a seamless transition into community college depends not only on academic performance in high school but also on family background, sociodemographic characteristics, and educational expectations (Goldrick-Rab & Han, 2010).

Despite empirical evidence indicating that continuous, full-time enrollment is the optimal scenario for degree completion, many community college students find that route impossible to follow. Nearly one fourth of them stop out from college within 9 months of initial enrollment. Only 31% of community college students enroll exclusively full time; indeed, 26% enroll less than half time. Part-time enrollment may result from competing demands with work or family or from an inability to afford full-time enrollment. One fifth of community college students

are married parents, 15% are single parents, and 10% are married without children (Horn & Nevill, 2006).

Although the most recognized form of student mobility is the upward transfer from a 2-year to a 4-year school, researchers have identified more than a dozen different types of multi-institutional attendance (Adelman, 2004; McCormick, 2003). Analyses of national transcript data reveal that students from the lowest socioeconomic bracket are disproportionately likely to engage in mobility patterns involving discontinuities in enrollment and “reverse” movement from 4-year to 2-year schools—aspects of mobility associated with much lower odds of completion (Goldrick-Rab & Pfeffer, 2009).

Success in postsecondary education is also affected by the age at which a student enters college. What some call a growing “disorderliness” in the traditional sequence of life events has resulted in delayed college entry for some and incomplete progress and later re-entry for others (Jacobs & King, 2002; Rindfuss, Swicegood, & Rosenfeld, 1987). Fifty-three percent of community college students are over age 23, and 35% are age 30 or older (Horn & Nevill, 2006). Women are more likely than men to enroll in community college later in life, and, according to one study, more than four fifths of women entering college after age 25 are actually reenrolling (Jacobs & King, 2002). Older students are disproportionately likely to juggle enrollment with work and family and thus more likely to enroll part time and also to experience life events such as marriage, childbirth, or divorce, which compete with schooling. In an analysis of the college completion rates of women over the age of 25, Jacobs and King (2002) found that these factors (particularly part-time enrollment)—rather than a student’s entering age—accounted for the observed lower rates of completion among older students.

### Discussion and Conclusions

Researchers and policy makers agree that improving rates of success among community college students is a top educational priority. Given all of the challenges community colleges face, what policies and practices represent the most promising areas for reform? Table 1 highlights 14 of the most popular and/or well-evaluated efforts. They all have received substantial financial or political support from state and local governments as well as philanthropies. They include approaches related to changing the opportunity structure (affecting federal and state funding mechanisms, financial aid processes, and institutional differentiation), institutional practices (changing pedagogical and organizational approaches), and incentives to change student behavior (particularly with regard to academic preparation and affordability). One area that is popularly discussed but not addressed here (because of the dearth of research in the public 2-year sector) is the potential for online solutions (for more, see U.S. Department of Education, 2009).

Unfortunately much of the best evidence on potential reforms is new—and scarce. Many studies purport to identify a set of best practices but are only able to produce suggestive conclusions that cannot tell policy makers how any one practice could create higher rates of student success (e.g., see Habley & McClanahan, 2004). A much more rigorous research agenda focused on community college students is needed to inform and evaluate future actions.

**TABLE 1***Potential areas for reforming community colleges*

Practice/initiative	Key features
Reforms targeting the opportunity structure	
Student Aid and Fiscal Responsibility Act of 2009: College Access and Completion Fund (pending)	Part of President Obama's 2010 budget; \$2.5 billion designated for state–federal partnerships; goal is to identify—through rigorous evaluation—practices that increase college attainment and bring them to scale (Moltz, 2009).
Performance-based funding	Tying 1%–5% of community college funding to outcomes; national associations representing community college presidents and trustees are working together on a voluntary framework of accountability (Dougherty, 2009).
FAFSA simplification	Reducing questions used to determine aid eligibility to increase effectiveness (Dynarski & Scott-Clayton, 2008); results of a recent experimental evaluation of the effects of simplification on college-going indicate positive impacts on college enrollment and choice (Bettinger, Long, & Oreopolous, 2009).
Articulation agreements	Policies intended to ensure smooth transfer of coursework between institutions; evidence is mixed as to effectiveness (Anderson, Alfonso, & Sun, 2006; Anderson, Sun, & Alfonso, 2006; Gross & Goldhaber, 2009; Roksa & Keith, 2008; Roska, 2009; Roksa & Calcagno, 2010).
Community college baccalaureate	Allowing community colleges to grant bachelor's degrees is increasingly popular, although there is not yet any evidence of effectiveness (Floyd & Walker, 2009).
Reforms targeting institutional practice	
Career pathways	"A series of connected education and training programs and support services that enable individuals to secure employment within a specific industry or occupational sector, and to advance over time to successively higher levels of education and employment within that sector" (Jenkins, 2006, p. 6). Attracting substantial philanthropic support.

*(Continued)*

**TABLE 1** (continued)

Practice/initiative	Key features
Contextualized learning	Connecting basic skills instruction to real world settings, helping adults progress to college-credit-bearing classes; a study of Washington State's I-BEST program is the best evidence of effectiveness (Jenkins, Zeidenberg, & Kienzl, 2009).
Learning communities	Model in which instruction is organized thematically and cohorts of students take multiple classes together. An experimental evaluation found mixed results: Whereas students in the program group reported feeling more integrated into college life, taking more courses, earning more credits, and moving more quickly through developmental English requirements, the program did not appear to increase college persistence (Scrivener et al., 2008).
Student life skills courses/ success centers	Orientation courses that attend to different learning styles and introduce study skills, time management, and effective college habits. An analysis of a course in Florida found higher rates of success over a 5-year period (Zeidenberg, Jenkins, & Calcagno 2007). An experimental study targeting success "centers" to students on probation produced positive increases in credits and GPA (Scrivener, Sommo, & Collado, 2009).
Smaller counselor-student ratios	A randomized evaluation of two Ohio community colleges found that reducing counselor caseload produced short-term positive impacts (Scrivener & Weiss, 2009).
Reforms targeting students Dual enrollment	Designed to move students more seamlessly from high school to college by allowing students to earn college credit while still in high school. Several studies indicate positive impacts (An, 2009; Mechur-Karp et al., 2008).
Early assessment programs	Provides high school juniors with feedback on their likelihood of needing college-level remediation. Results indicate that doing so does not appear to discourage students from later enrolling in college but does significantly reduce their chances of needing English or math remediation when they do enroll (Howell, Kurlaender, & Grodsky, 2009).

(Continued)

**TABLE 1** (continued)

Practice/initiative	Key features
Performance-based scholarships	Need-based financial aid tied to GPA and/or credit intensity requirements; aid paid in installments. One randomized trial in New Orleans found positive impacts on credits (Richburg-Hayes, 2009).
Emergency financial aid	Funds provided to help students quickly meet financial obligations. Nonexperimental evidence suggest this helps keep students enrolled (Geckeler, Beach, Pih, & Yan, 2005).

*Note.* FAFSA = Free Application for Federal Student Aid

Future research to identify additional promising practices and policies should continue to take into account each of the levels of influence identified in this review. There is a tendency in studies of community colleges to solely emphasize the constraints colleges face that stem from the many needs of their students. Although student-level factors appear to be more important in predicting student outcomes than institutional or structural factors, the possibility remains that these relationships are constrained by the data available to include in statistical models and how those models are constructed (Bailey, Jenkins, & Leinbach, 2005).

One way to stimulate a shift in reform emphasis is to reorient the measurement of student success to account for structural and institutional constraints. Although it is becoming common, for example, to adjust calculations of institutional graduation rates to reflect the level of financial need of enrolled students (e.g., see Taylor et al., 2009), it remains less common to also adjust those calculations for relative state support or institutional expenditures (such as suggested by Gold, 2006, and Bailey, Jenkins, & Leinbach, 2005). The move to performance-based funding and greater accountability should be accompanied by shifts in measurement and calculations of success.

It is particularly important that we identify creative ways to test the effects of new financial investments in community colleges and assess their intended and unintended consequences. The relationship between monetary investments (spending) and student outcomes is far from conclusive, and community colleges—like all public institutions in higher education—face significant budget constraints. State support, although rebounding slightly in the past year, has steadily eroded over time, and prospects for the future look bleak (Dembicki, 2008). Any new federal support will likely be distributed unevenly across states and colleges, which in turn are experiencing the recession in different ways. This may provide some enhanced opportunities to assess how colleges with more or less resources produce higher or lower graduation rates.

Among those institutional practices deserving of more careful analysis are learning communities, first-year support service programs, and adult literacy programs. As Comings and Soricone (2006) have noted, most studies of such programs lack longitudinal samples and/or appropriate comparison groups, and, perhaps most troubling, implemented programs often deviate from their

intentional intervention designs. Thus, it is difficult to determine whether the programs truly increase academic momentum or whether they simply attract students more likely to make academic progress in the first place, and it is hard to compare the conditions under which programs are more or less successful in order to draw lessons about how to improve program effectiveness. Thus, there is significant demand for more research using experimental or quasi-experimental methods to test specific curricula and support services and to examine effects for subgroups of learners (Comings & Soricone, 2006).

We also need to know much more about how faculty members affect student success in community colleges. Higher education is a labor-intensive industry, and investments in instruction are particularly expensive. Although the reliance on part-time faculty is unlikely to subside in coming years, more evidence is needed on what kinds of professional development and support translate into more effective teaching practices.

Finally, we should expect research on the effectiveness of student-directed incentives to continue. Undergirding many education reforms across the K-16 spectrum appears to be an assumption that students can be motivated to work harder—thereby driving up graduation rates. Pay-for-performance efforts include those that reward grades among elementary school students and continued enrollment among college students. Although these efforts cost money, they might be cost-effective if they generate substantial impacts without requiring the overhaul of major policies or institutional practices.

All efforts to enhance community college student success should be rigorously evaluated with frameworks that are capable of both estimating and explaining impacts. We need to know what works and why. Such an agenda necessitates improvements in data quality, because relatively few national longitudinal surveys include sizeable samples of 2-year college students, and only a handful of state data systems allow researchers to track students into higher education and among 2- and 4-year colleges. Having an incomplete picture of student pathways through college may lead analysts to draw unsupported conclusions. Selection bias is a statistical problem plaguing much of higher education research, because college outcomes can be observed only for those who participate, and participants differ in important and often unobservable ways from nonparticipants. This area of research is dominated both by descriptive rather than explanatory analyses and by multivariate analyses that attempt to make causal arguments without first taking the necessary steps to minimize selection bias. These issues can and should be remedied by current and future generations of researchers.

The best research on community colleges moving forward will be interdisciplinary and use both quantitative and qualitative methods. Far too often researchers, just like policy makers and practitioners, act in silos, failing to consider each others' theories or evidence. As a result, too much time can be devoted to one policy strategy or another, and unintended consequences may occur. The increased attention to the public 2-year sector in policy circles should be matched by increased attention by researchers.

Despite the inherently varied and multifaceted nature of the American community college mission, it is clear that in this economic environment, improving the academic achievement of students attending community college must remain a top priority. Some students enroll at 2-year colleges because they want to, others

because they feel they have few other options. That so many fail to make progress, getting stuck often very early in their trajectories, is evidence of both the numerous barriers that these students face and a failure by colleges and states to identify and implement effective reforms. We still know far too little about what works, but what evidence we do have indicates a need for a multifaceted approach that is flexible enough to accommodate the variety of student needs and ambitious enough to create meaningful change. It is possible for policy makers to serve all kinds of students while achieving greater levels of success. Doing so will require the coordination of proven educational practices that work together, and not at cross-purposes, toward the common goal of increasing academic momentum. Colleges and universities should be active participants in (rather than the objects of) such efforts and should be allowed autonomy to achieve these ends while being held accountable for making sure goals are met.

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