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Paths to Persistence:

An Analysis of Research on Program Effectiveness at Community Colleges

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Executive summary

Community colleges are designed to be open-door institutions, and they enroll a much wider variety of students than baccalaureate-granting colleges. Community colleges have always played a crucial role in providing access to college. During the last decade, however, educators and policy-makers have shifted their attention also to the success of students once they enter community college. As a result, accreditation agencies and state regulators are increasingly scrutinizing measures of student outcomes such as persistence and completion rates.

At the same time, national initiatives by foundations and the U.S. Department of Education are focused on developing policy and institutional practices that will improve success rates for community college students. This report has been written as part of one of those initiatives. In 2003, Lumina Foundation for Education joined eight other organizations to launch Achieving the Dream: Community Colleges Count. Achieving the Dream is based on the premise that research about and at community colleges must play a central role in any strategy to increase student success.

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This report presents a critical analysis of the state of the research on the effectiveness of four types of practices in increasing persistence and completion at community colleges: 1) advising, counseling, mentoring and orientation programs; 2) learning communities; 3) developmental education and other services for academically under-prepared students; and 4) college-wide reform. We use this analysis to draw substantive lessons about effective institutional practices, to identify promising areas for future research, to evaluate the state of program-effectiveness research at community colleges, and to make recommendations for improving related research.

Substantive lessons

Among the practices and strategies that we examined, learning communities appear to have the most support grounded in research. In a learning community, students go through the program as a cohort, and their instruction is typically organized around themes. The learning community model's positive effects on persistence and graduation are consistent with the most influential theoretical perspectives used to study retention. Empirical research also suggests positive effects. Research conclusions point out that counseling, advising and developmental education are all crucial for community college students, but research has been less helpful in identifying the most effective design and organization for these services. Major national research projects in these areas are now a decade old, and the policy and demographic environments have changed significantly in the intervening years. Studies of broad, college-wide change and the institutionalization of pilot programs are particularly wanting. We lack good conceptualizations as well as empirical measurement of these types of strategies.

Improving research

Research on program effectiveness at community colleges can be improved by addressing problems in four areas. First, the large majority of the research on program effectiveness in higher education is limited to studies of four-year colleges. Insights obtained from this research do not necessarily translate to effective practices for the part-time, working and adult population that characterizes community colleges. Second, the national data sets that allow comprehensive analysis of the experience of postsecondary students do not include data on the types of specific institutional practices and policies that colleges use to increase student success. Third, methodological problems thwart definitive conclusions about the effectiveness of community college policies and practices. Fourth, the dissemination and discussion of research on community colleges are inadequate. Reports are difficult to obtain and usually include too little information to allow a judgment about the validity of the conclusions. Faculty and even researchers at community colleges rarely have the opportunity to discuss research on program effectiveness in a way that allows them to understand the strengths, weaknesses and lessons of the studies.

Most program-effectiveness **research** is based on **samples** from **single** institutions.

To strengthen our ability to choose and assess policies and practices that will help increase the success of community college students, we suggest the following changes in community college research:

Theoretical issues: The dominant theoretical perspective on retention and completion, the student integration or engagement model, was developed based primarily on four-year college models with particular emphasis on full-time, traditional-aged, residential students. Empirical tests of these models have not yielded strong support for their application to community colleges. Researchers have begun to take into account commuter students, but the particular characteristics of community colleges and their students are still neglected.

Data availability: Because insufficient national data exist on institutional practices, most program-effectiveness research is based on samples from single institutions. While these can be useful, their conclusions are difficult to generalize because effects may be based on particular features of the college being studied. As much as possible, national-level databases, such as those created by the National Center for Education Statistics, should include programmatic detail to allow research on the effectiveness of common practices

used to improve student success. Collaborative projects within community college districts and states, supplemented with increasingly available state- or district-level student record data, also would be helpful in understanding persistence and student success and in overcoming some of the limitations of single-campus studies. Even with single-institution studies, research that makes use of transcript-based longitudinal data can provide many important insights.

Empirical issues: There are some excellent studies on program effectiveness at community colleges; in general, however, empirical research needs to do a better job of exploiting available data and of employing quantitative and qualitative methodologies for effectiveness research. Too few studies that measure a relationship between community college programs and student outcomes are designed in ways that support conclusions about whether that relationship is a causal one. The following suggestions can strengthen the reliability and validity of research on these issues.

- Empirical research must, as much as possible, control for measured student background characteristics. Scores on entry assessment tests or information on the high school academic record are particularly important.
- Under some circumstances, statistical techniques can account for unmeasured characteristics, such as motivation, that might influence student outcomes. These techniques are not now used in community college research.
- Random-assignment designs address many of the most difficult methodological problems; thus, their conclusions are particularly useful and influential. However, because such studies are costly and difficult to administer, they are infrequent.
- Finally, every study of a program must include a detailed description of the characteristics of the program and of the process through which students enter that program. This information gives readers essential background that allows them to interpret the research results and judge the validity of the conclusions.

Research at the community college: Although university researchers must pay more attention to community colleges, research will have a fundamental influence on the colleges only when it plays a more prominent role on the campuses themselves. Reformers refer to this as developing a "culture of evidence" in which institutional research functions play a more prominent role and faculty and administrators are more fully engaged with data and research about the success of their students, using those data to make decisions. We present six suggestions for developing that culture:

Research will have a fundamental **influence** on the **colleges** only when it plays a more **prominent role** on the campuses.

1. Colleges must assess the resources and skills needed for effective institutional research, recognizing that research is an investment. As with even the most rewarding investment, its payoff emerges only over time.

2. Colleges must recognize that assessments of program effectiveness are difficult and involve a continuum of activities and analyses.

3. Projects should combine quantitative research on student outcomes with qualitative research to elicit insights from students about those outcomes.

4. Colleges, states and college associations must provide more opportunities for faculty and administrators to engage in the research process and to discuss evidence about student outcomes.

5. Colleges and states must develop more systematic methods to publicize and disseminate research findings.

6. Collaboration among institutional researchers at different colleges and between college-level and state-level researchers should be promoted.

This report argues that much needs to be done to strengthen research on community college program effectiveness. Too often, research provides ambiguous or weak guidance concerning many policies and programs designed to improve student retention and success. Of course, despite these uncertainties, colleges must continue to move forward and act on the best available knowledge — even if that knowledge is limited or open to alternative interpretations. Our overall recommendation is that colleges search for the best information they can find and monitor progress as thoroughly and rigorously as possible. The interaction between research and practice involves a continuous conversation within and among the colleges, and with outside researchers and policy-makers, as practitioners try to improve their performance in a constantly changing environment.

Introduction

Community colleges are designed to be open-door institutions. They enroll a much wider variety of students than baccalaureate-granting colleges: Minority students, first-generation college students, students with lower levels of academic achievement in high school, and students from low-income families are all significantly overrepresented in community colleges when compared with their enrollment in baccalaureate-granting institutions. During the decades of rapid expansion of community colleges, these considerations of access were paramount, but more recently educators, policy-makers, researchers and foundations have all increasingly turned their attention to the actual experience of students enrolled in these institutions. This focus has revealed that community college students have low persistence and completion rates. Of all first-time college students who entered a community college in 1995, only 36 percent earned a certificate, associate's or bachelor's degree within six years. Although many students who did not complete degrees may have met other personal goals, policy-makers and educators judge these rates to be too low (Bailey & Leinbach, 2005). Moreover, completion rates for African-American, Hispanic, Native American and low-income students are lower than the overall numbers, indicating inequitable racial and income gaps.[1]

Community college students have low persistence and completion rates.

National initiatives by foundations and the U.S. Department of Education are focused on developing policy and institutional practices that will improve retention, completion and other measures of success for community college students. These initiatives also aim to reduce the achievement gaps between students from different racial/ethnic and income groups. This report has been written as part of one of those initiatives. In 2003, Lumina Foundation for Education joined with eight other organizations to launch Achieving the Dream: Community Colleges Count.[2] In early 2005, Achieving the

Dream is working with 27 community colleges in five states to help them increase retention, completion and success for community college students, particularly those in groups that have been underserved in higher education, such as low-income students, students of color and first-generation college students. Research and data are at the heart of all aspects of Achieving the Dream. First, colleges are expected to use institutionally relevant data and research to measure the current levels of students' success. Data are to be disaggregated by race, ethnicity and income (when possible) and to be used to diagnose the causes of the problems they identify. Moreover, participating colleges are expected to select strategies and interventions for which there is empirical evidence of effectiveness. Finally, the initiative is designed to help the colleges strengthen their own capacity to conduct, and particularly to use, institutional research on an ongoing basis to identify problems and choose and assess alternative solutions. This broader objective is articulated in the admonition to develop a "culture of evidence," rather than relying on a "culture of anecdote" in which community colleges justify themselves simply by telling encouraging stories about individuals who overcome daunting barriers to succeed at community colleges.

The goal of this report is to provide background information and analysis to support a broad effort to strengthen the use of data and research in improving student outcomes at community colleges. It starts by presenting an overview of the state of research on the effectiveness of institutional programs and policies designed to improve community college student outcomes, particularly persistence and completion. The next section discusses the most common theoretical perspectives used in the study of retention and completion in higher education and questions the appropriateness of applying those perspectives to community college students. We then review research on effectiveness of community college programs in four broad areas: student services and advising, developmental education, learning communities and institution-wide reform. In addition to drawing programmatic lessons from this literature, we use these analyses to support generalizations about the state of program-effectiveness research on community colleges. We end with conclusions and recommendations for research about community colleges and for reforms in research done on community college campuses — reforms that can help develop a "culture of evidence" at the colleges.

The state of research on persistence and completion

A wealth of research exists on persistence and completion in higher education. In 1991, Ernest Pascarella and Patrick Terenzini published an 800-page volume reviewing almost 3,000 studies on *How College Affects Students*, including many studies of retention and completion. Since then, research on the topic has continued in journals and in unpublished reports. But this vast landscape of papers and reports yields relatively few concrete insights about our specific topic: the effects of institutional policies on community college retention and completion.

Most of this research is about four-year colleges.

This dearth of insight results largely from four problems. First, most of this research is about four-year colleges. Second, available national (or even multi-college) data do not have good measures of institutional practices designed to promote retention and completion. Third, flawed methodology often thwarts efforts to properly assess institutional practices. Fourth, the dissemination and discussion of research reports on community colleges are inadequate. We shall examine each of the four problems in turn.

1. Overemphasis on the four-year college: The vast majority of the research on student retention and completion is concerned with four-year colleges. In concluding their definitive review, Pascarella and Terenzini (1991) state that their work was "based almost exclusively on samples of traditional college students who are age 18 to 22, who attend four-year institutions full-time, and who live on campus" (p. 632). This review is now almost 15 years old. There is no question that community colleges have attracted more attention during the last decade, but this new interest is not reflected in published research. A review of articles published in five mainstream higher education journals[3] between 1990 and 2003 by Townsend, Donaldson

and Wilson (2004) found that only 8 percent of the 2,321 articles even mentioned community colleges.

The lack of research on community colleges is a particularly serious problem when it comes to the study of retention. Much of the research and thinking on retention has been based on the concepts of student engagement and integration with the college. These concepts are likely to be most powerful for residential students, who represent a small minority of the student population at community colleges, which are primarily commuter schools. But what differentiates the community college student body is the predominance of part-time students: Only 36 percent of community college students attend full-time, while 71 percent of four-year college students are enrolled on a full-time basis.[4] In addition, community college students tend to be older, are more likely to be working, and are more likely to interrupt their enrollments. Policies designed to retain 18-year-old students living in dorms are not likely to be as effective for part-time, working students and especially for adults with families and full-time jobs.

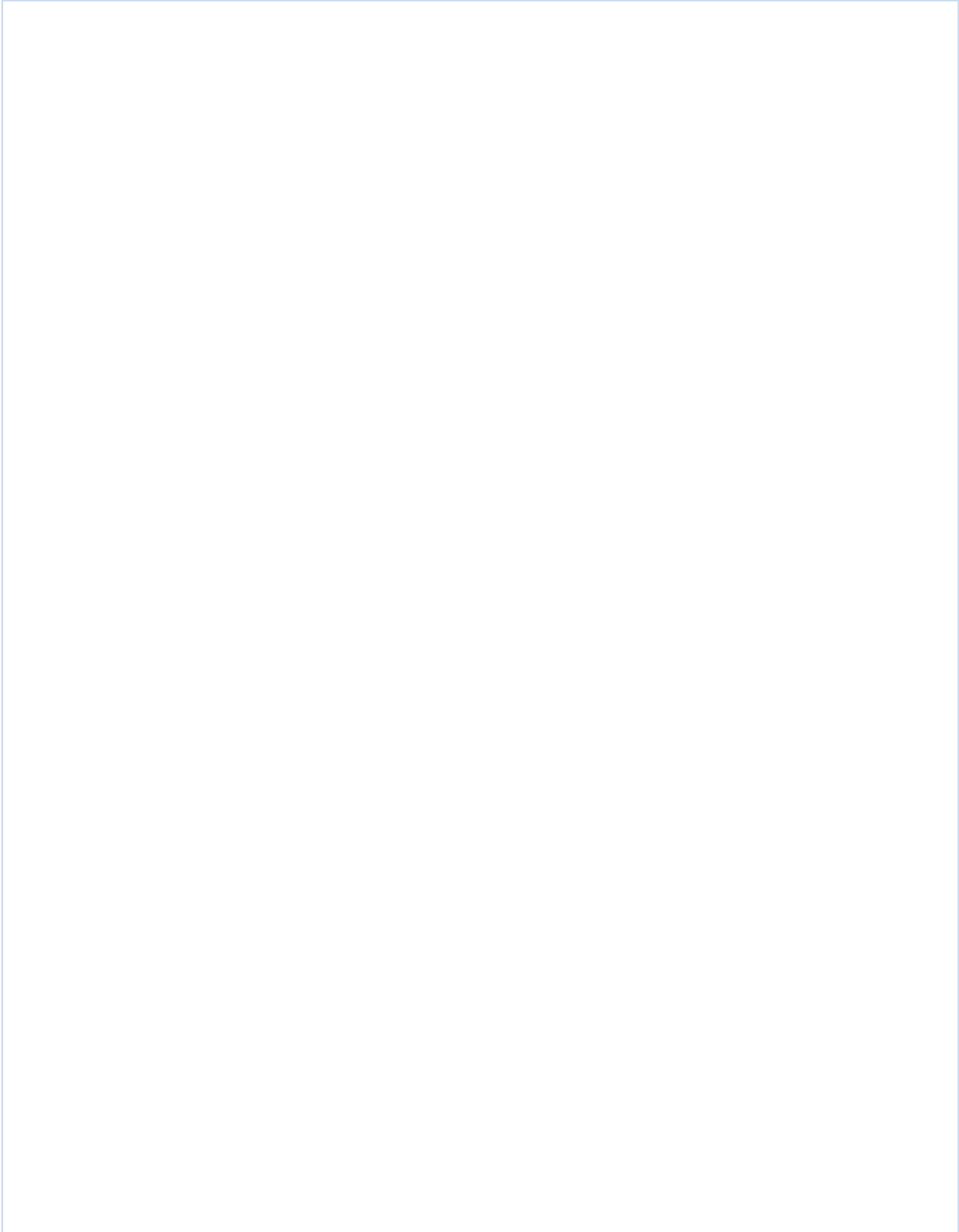
Community college **students** tend to be **older,** are more likely to be **working,** and are more likely to **interrupt** their enrollments.

2. Lack of data on institutional policies: The primary source for national data on institutional characteristics is the Integrated Postsecondary Education Data System (IPEDS) collected by the National Center for Education Statistics (NCES). IPEDS includes data on more than 1,000 community colleges, but it has little detail on the types of institutional practices colleges use to improve retention — student services, pedagogic strategies, organizational innovations, etc. Therefore, most studies of the effects of institutional practices are based on student surveys and often involve only a single institution. They are of mixed quality and, in any case, produce results that are difficult to generalize. To the extent that results depend on answers provided by students, the studies also fail to measure institutional practices directly. In contrast, there are much better national data available to study the relationship between individual characteristics and retention and other educational outcomes. This is interesting research, but it does not answer our question — how do institutional factors and policies influence retention and completion?

3. Methodological problems: Evaluations of institutional practices are notoriously difficult because of problems with the attribution of causality. Most practices that are studied involve discrete programs; some students are in those programs, and others are not. Studies of the effectiveness of the programs generally consist of a comparison between those two groups of students, but these types of comparisons often do not provide enough information to make a valid judgment. As long as there is some non-random process by which students enroll or are chosen for such a program, it may be that any differences between participants and non-participants result from the selection process, not from the program itself. Thus, even though a program shows positive results, those results may not hold for other groups of students. There is no question that causality problems can be difficult, but there are techniques that can be used to address them. As this report will show, much of the research on community colleges fails to make use of these techniques.

4. Inadequate dissemination and discussion: Methodological problems are compounded by the methods generally used in community colleges to disseminate and discuss institutional policy and initiatives. Results are often posted on Web sites,

frequently in the form of PowerPoint presentations, or are presented at conferences and conventions, such as those held by the American Association of Community Colleges or the League for Innovation in the Community College. Most of these studies, however, are unpublished and therefore may not undergo a rigorous vetting and quality-control process. Full reports often are difficult to track down and rarely provide enough methodological detail for the reader to make a judgment about the reliability of the results. In general, community college institutional researchers and practitioners get little chance to discuss research findings in a way that might allow a more comprehensive understanding of the results and implications of existing research.



Conceptual perspectives on retention and completion

In this section, we discuss in more detail the theoretical approaches to studying student retention and how they are used for the analysis of community colleges. Vincent Tinto's (1975, 1993) *student integration model* forms the conceptual basis of much of the research on persistence and graduation. It also has some attractive implications for institutional policy. Tinto's model is designed to help colleges understand why students leave, so the institutions can design activities to better serve students' needs and thereby increase retention and graduation rates. Tinto states that students' departures from an institution "reflect the character of the individual's social and intellectual experiences within the institution. Specifically, they mirror the degree to which those experiences serve to integrate individuals into the social and intellectual life of the institution" (1993, p. 51). This model differentiates between *social integration*, which is measured by such factors as interaction with faculty and participation in extracurricular activities, and *academic integration*, which is usually measured by grades or other indications of academic achievement. This perspective implies that institutions should develop processes and activities that foster both types of integration among college students.

Research on student integration has a profound causality problem.

Although this model resonates with educators and portrays an attractive college environment, empirical analysis has been difficult. Research on student integration has a profound causality problem. Studies of four-year colleges show that students who participate in student organizations or interact with faculty persist and graduate at higher rates. Still, it does not follow that graduation rates will increase if every student joins a student organization or interacts with faculty. Students may interact with faculty *because* they and

the faculty share values and an orientation toward academic activity. For example, Pascarella and Terenzini (1991) reported the results of a study that concluded: "educational aspirations are more likely to influence contact with faculty than contact with faculty is to influence educational aspirations" (p. 395). This problem is compounded when studies are done on single institutions. In these studies, students often are asked to fill out questionnaires, and their levels of social or academic integration are scored based on their answers (for example, see Napoli & Wortman, 1998). But if the students are all at the same institution, then presumably they all have access to the same services or activities that might promote integration. If the students share the same environment, then measures of integration are measures of individual characteristics, not institutional characteristics. Thus, the types of studies that show a relationship between social integration and retention do not imply that introducing policies to promote integration will necessarily increase retention.

In contrast to the theoretical emphasis on social integration, Bean and Metzner (1985) explicitly developed a model of attrition for nontraditional students, both at four- and two-year institutions. Their contention was that social integration would play a much smaller role among these students and that outside "environmental" variables would be more important. These variables included finances, hours of employment, outside encouragement and family responsibilities. They also suggested that "goal commitment" and "intent to leave" were important for nontraditional students and that these students are more focused on the economic benefits of their education.

Since Bean and Metzner (1985) place a great deal of importance on environmental factors outside the college's control, their approach would appear to leave less potential for an institutional response. In their model, the two variables that are under the control of the colleges are academic advising and course availability. Presumably, academic advising should be designed to increase goal commitment and influence the student's intent to leave. Course availability is certainly a logical determinant of attrition, especially for nontraditional students, who generally have a more instrumental view of their college education.

More recently, Braxton, Hirschy and McClendon (2004) have attempted to extend Tinto's model to "commuter universities and colleges." Unlike residential colleges, the authors say, "commuter colleges and universities lack well-defined and -structured communities for students to establish membership" (p.35). The authors' recommendations focus first on building student involvement in the classroom through learning communities. This is a logical emphasis since the classroom is the place where commuter students have the most contact with the college. Braxton and his co-authors also suggest that colleges need to try to connect with parents and spouses, since "significant others" have more day-to-day influence on commuter students than they do on residential students. Braxton and his co-authors also emphasize practical considerations such as providing courses at convenient times and locations, developing jobs on campus (to ease the college/work conflict), and providing day care.

Academic advising should be designed to increase goal commitment.

Their work is an important advance in that it explicitly takes account of the special needs of non-residential students. Nevertheless, the analysis does not differentiate between two- and four-year colleges, and the authors suggest that this is something that remains to be done. Overall, the book leans more toward a four-year college perspective, partly because it relies on a body of research that is dominated by four-year college studies. For example, the book contains no discussion of issues related to developmental

education or to students with explicit occupational goals. Community college faculty and administrators would generally agree that the problems of academically underprepared students and the developmental programs designed to help those students need to be central components of any framework for understanding and improving community college retention.

What does empirical research suggest about these models? Although many methodological problems persist, many studies do suggest that academic and social integration have positive effects on the persistence of four-year college students, especially residential students (Braxton, Hirschy & McClendon 2004; Cabrera, Nora & Castañeda, 1993). In an extensive review of research on college student outcomes, Pascarella and Terenzini (1991) found that both the frequency and quality of interactions with peers and faculty and the participation in extracurricular activities — measures of social and academic integration into the college life — contribute positively to students' persistence at baccalaureate-granting institutions. However, the effect is weaker when factors such as student characteristics, pre-college experiences and other college experiences are taken into account.

Interestingly, Tinto's model (1997, 1993) has had more influence on community college research than Bean's and Metzner's framework (1985), despite the latter's attempts to address the problems of nontraditional students. Many studies of community college attrition are explicitly set up as tests of the student integration model, but research on social engagement by community college students is at best mixed. Pascarella, Smart and Ethington (1986) found that academic and social integration did have positive effects on persistence, but they used a specialized sample, which included first-time college students enrolled in community colleges in 1971 and who aspired to a bachelor's degree.[5] In their review of integration research on community college, Bean and Metzner (1985) concluded that "social integration is rarely a major factor in attrition decisions" at commuter institutions (p. 520). In their 1991 review of empirical research on undergraduate student attainment, Pascarella and Terenzini contended that these models do not work as well for commuter colleges as for residential colleges, stating that "with a few exceptions, the weight of evidence is clear that various measures of social integration (including interaction with faculty, interaction with peers and extracurricular involvement) show little if any positive relationship with persistence at commuter institutions. This lack of a positive relationship holds regardless of the specific measure of social integration used and irrespective of whether or not student background characteristics were taken into account in the study design" (p. 402).

Many **studies** suggest that academic and social **integration** have **positive** effects on persistence.

Subsequent research, not reviewed by Pascarella and Terenzini, continued to find mixed effects. Bers and Smith (1991) and Napoli and Wortman (1998) found small positive effects, Borglum and Kubala (2000) found no effect, and Nora, Attinasi and Matonak (1990) found a negative effect of social integration on persistence. But all of these results came from single-institution studies that determined levels of integration based on answers to surveys administered to the students; these studies do not measure the influence of policies to promote social integration on persistence.

In a recent review of empirical tests of Tinto's integration model, Braxton, Hirschy and McClendon (2004) found strong empirical support for the application of the model to residential colleges and universities. For commuter universities, they found "modest" support for the role of social and academic integration in promoting "commitment to the institution" if not persistence itself (pp. 16-17). With respect to the model's

usefulness for community colleges, these authors stated: "Given this configuration of support [the pattern of empirical support that they found in their review], the explanatory power of Tinto's theory to account for student departure in two-year colleges remains undetermined and open to empirical treatment" (pp. 17-18).

What are the implications of these theoretical perspectives for institutional practice? In particular, the concept of social engagement is probably most relevant for a college experience typified by the residential liberal arts college with multifaceted interactions inside *and* outside the classroom among students and between students and professors. Given the nature of their students and the large number of part-time faculty, trying to reproduce the liberal arts/residential ideal may not be the best strategy for community colleges or their students. The empirical record is certainly consistent with this conclusion.

With respect to institutional practice, Bean and Metzner (1985) emphasize the importance of *academic advising*, presumably to influence students' goal commitment and "intent to leave." We review the research on advising later in this report. The *availability of courses*, another variable in the Bean and Metzner model, has not played an important role in subsequent empirical research — perhaps because most studies are about a single institution — yet this ought to be a promising direction for research. Braxton, Hirschy and McClendon (2004) also emphasize course availability, and they add day care. Other factors that might be particularly important for community college students include *convenient transportation*, *high-quality online education*, *applied pedagogies* and *well-designed internships*. These features may be more important to community college students than the nature of their relationships with professors or participation in student organizations.[6] Thus, researchers should certainly be looking for other institutional variables that do a better job of matching the needs of the typical part-time, working community college student — needs that are as much practical as they are psychological.

The one place where the engagement model may be most relevant at the community college is in the classroom. This, after all, is where even commuter students interact with faculty and potentially with other students. Designing the classroom experience to promote more meaningful interaction among students and teachers is one promising strategy for community colleges; we will examine efforts to do this later, during our discussion of learning communities.

Empirical studies of the effect of institutional management and practices

Much research in the academic literature has been concerned with testing various theories of student persistence and completion. As we have emphasized, however, little of this work directly tests the effects of institutional practice on student outcomes. Another genre of research asks a more direct set of questions to determine whether students who participate in a particular *type* of program or activity persist or graduate at higher rates. In this section we turn to studies that take this more straightforward approach.

Although there are many studies on a long list of possible program activities, we focus here on four large categories: student services (such as advising, counseling, mentoring and orientation programs), learning communities, developmental education and college-wide reform. Our purpose is to draw substantive conclusions and to illustrate the status of research on the effectiveness of practices at community colleges.

Advising, counseling, mentoring and orientation programs

Colleges have been experimenting with various types of advising and student services for decades. According to Pascarella's and Terenzini's summary on the effect of such programs, "the most consistently effective program format appears to be a first-semester freshman seminar that meets as a regular class with an assigned instructor. The purpose of this type of seminar is to orient the student to the institution and its programs and to teach important academic survival skills" (Pascarella and Terenzini, 1991, p. 403). Muraskin and Wilner (2004), in their review of institutional practices, also concluded that freshman-year programs were effective. Nevertheless, both sets of authors acknowledged that participation in the programs was voluntary. Therefore, the positive association might be influenced by initial student characteristics and not the service itself. Still, the consistency of the findings gives more weight to the positive conclusions.

Evidence on the effectiveness of other types of advising and counseling is more mixed. Pascarella and Terenzini (1991) concluded that when students' pre-college characteristics were taken into account, relatively short-term orientation programs had a trivial and statistically insignificant direct effect on persistence. They also found mixed results from research on the effects on persistence of the amount and quality of academic advising. Muraskin and Wilner (2004) reported that persisting students tended to express higher satisfaction with counseling services than did those who left, although research on the impact of such services was also mixed. The authors also suggested, though, that measurement of counseling effectiveness may be distorted because students who use counseling may have come to the college with more problems than those who do not use it. This is a situation in which failing to account for differences in the characteristics of program participants and non-participants may understate the effectiveness of a program.

Early intervention for academically weak community college students, through counseling or other student support services, is thought to improve their persistence and academic performance (Grubb, 2003; Summers, 2003). Summers (2003), in a review of the literature on the impact of counseling on attrition, indicated that studies have found that counseling increases the retention of students who are identified as highly likely to drop out.

Student Support Services (SSS), funded under the federal TRIO programs, is perhaps the most widespread student services initiative. SSS was evaluated in the mid-1990s, and the study found that "freshman-year SSS participants increased their grade point averages by 0.15 in the first year and 0.11 in the second year of college. SSS participation also increased retention to the second year of college at the same institution by 7 percent and retention to the third year in *any* institution by 3 percent" (Muraskin, 1997, p. 1). Interestingly, the study also found that effects increased with increased exposure to SSS activities. The author identified peer tutoring, workshops and cultural events as effective components, with peer tutoring shown as particularly effective. This was a comprehensive study, and the author was careful to compare the characteristics of participants to non-participants; nevertheless, he cautioned that unmeasured motivation still might have influenced both enrollment and program effects. Finally, the evaluation did not focus particularly on community colleges. Indeed, only one of the five colleges that were used in a follow-up benchmarking study was a community college (Muraskin, 1997).

Studies on counseling and advising primarily concern four-year colleges.

Thus, the studies on counseling and advising primarily concern four-year colleges. Research on these services, and on institutional practices in general, is much scarcer for community colleges. For example, a recent review of attrition research at community colleges by Summers (2003) cited only two unpublished single-institution studies on student support services, although it reported positive effects of "matriculation" services such as assessment, orientation and counseling.

The experience of the Community College of Denver (CCD) has been particularly influential in the discussion of policy and practice in community colleges. A book by Roueche, Ely and Roueche (2001) provides a description of many of the practices and strategies that the college used. CCD's counseling and academic support services are organized in a comprehensive unit called the Academic Support Center (ASC). The college reports that the class withdrawal rate was 7.8 percent for students receiving ASC support, while the overall campus rate was 12.4 percent. Although this finding is encouraging, the reports do not include information that would allow a judgment about how students got access to these services

and the comparability of the ASC students with other students at the college.

Research on counseling and student services suggests that such programs can play an important role in retention and graduation. At the same time, this body of research supports two generalizations about research on community college practices. First, although formal counseling would seem to be particularly important for community college students (who are likely to have fewer informal sources of information and guidance than students at four-year institutions), the large majority of research on any particular higher education practice is limited to four-year colleges. Second, while there are some encouraging results from the smaller amount of community college research, the material published from that research does not permit a judgment about the validity of its conclusions.

Learning communities

In the last 15 years, educators in both two- and four-year institutions have experimented with learning communities as a means of engaging and motivating students. Learning communities typically organize instruction around themes, and students go through such programs as cohorts. Learning communities are designed to provide more coherent and engaging experiences than traditional courses, and to give students and faculty more opportunities for increased intellectual interaction and shared inquiry (Knight, 2002; Smith et al., 2004; Tinto, 1997; Tinto & Love, 1995). The learning community model is particularly interesting for community colleges because it is one way that these commuter institutions can engage with their students in a more intensive way than normally occurs in the classroom (Braxton, Hirschy & McClendon, 2004; Fogarty & Dunlap, 2003; Grubb & Associates, 1999). If the student integration model does apply to community colleges, it would probably be implemented with classroom-oriented approaches such as learning communities. In fact, many community colleges have adopted various forms of learning communities, specifically as a strategy to develop a more coherent intellectual environment and forge stronger links with the diverse and fragmented community college student body (Fogarty & Dunlap, 2003; Smith et al., 2004).

Learning communities typically organize instruction around themes.

On the other hand, the design of learning communities may discourage nontraditional students from participating. Because a learning community often requires a cohort of students to attend several classes as a group, it may be difficult for working students or students attending part time to participate. Because learning communities require close coordination among professors, they appear to be most effective when regular, full-time faculty members are used rather than part-time adjuncts. Yet, full-time faculty are more likely to teach during the day, rather than at night when many nontraditional students attend classes. These factors suggest that learning communities may attract more middle-class, traditional-age students among those enrolled in community colleges.[7]

In 2003, the National Learning Communities Project at The Evergreen State College in Olympia, Wash., published an extensive review of more than 100 studies of the effectiveness of learning communities (Taylor et al., 2003). What is remarkable about this review is the length to which the authors went to find unpublished as well as published research. As a result, this publication gives an unusually comprehensive picture of the state of research on this topic, including, indeed predominantly, studies conducted by institutional researchers at colleges. The authors concluded that "a preponderance of studies indicate that learning communities strengthen student retention and academic achievement" (p. iii).

Thus, research on the effects of learning communities is encouraging, yet the comprehensive review of effectiveness studies also illustrates many of the challenges to community college research (Taylor et al., 2003). For example, the large majority of such studies were unpublished, single-institution assessments; only one-seventh were published in journals or books. Therefore, while there is a tremendous amount of material on learning communities, much of it is difficult to obtain. Some of the reported studies based their assessments on comparisons between learning community and non-learning community students, controlling for entering academic characteristics. But without knowing more about the process used to recruit and enroll students into learning communities, it is difficult to judge whether these controls were adequate to account for initial differences between learning community and comparison students.

Only 32 of the 119 studies, or about one-quarter, covered community colleges.

Not surprisingly, learning communities in four-year colleges have received much more attention than those in community colleges; only 32 of the 119 studies, or about one-quarter, covered community colleges. Taylor et al. (2003) chose 17 studies that were "deemed notable for the quality of the assessment study and the manner in which it was reported" (p. 4). Of these, only one was about a community college program. The review does not discuss issues associated with the design and effectiveness of learning communities at community colleges — in particular, how effective the innovation is for the more typical part-time community college student.

The best-known evaluation of community college programs is the 1997 article by Tinto published in the *Journal of Higher Education*, "Classrooms as Communities: Exploring the Educational Character of Student Persistence," which discussed learning communities at Seattle Central Community College. Tinto found that participation in a learning community did increase the probability of quarter-to-quarter persistence. Based on a qualitative analysis, he argued that learning communities promote persistence by facilitating the creation of supportive peer groups among students, encouraging shared learning, and giving students the opportunity to actively participate in knowledge creation. This study used a multivariate methodology that controlled for possibly confounding characteristics. Tinto also recognized the potential distortion in the model caused by student self-selection, and he presented an argument for explaining why it was not a problem.[8] In contrast to the results from the Seattle study, an earlier study of learning communities at LaGuardia Community College by Tinto and Love (1995) found that participation in learning communities did not significantly increase the probability of persistence.

In 2003, the research organization MDRC started an evaluation of learning communities at Kingsborough Community College. The study involves full-time freshmen between ages 17 and 34, most of whom had applied directly to Kingsborough after missing the application deadline for the City University of New York (CUNY) system.[9] Other students who had low placement test scores were also invited to participate. Students were assigned, through a random selection process, to learning communities or to a control group that received services generally available to students at the college. The course-taking patterns of both groups were tracked through the second semester. Preliminary and unpublished results suggest that the learning community students had passed more courses (including basic English classes) and had higher grade point averages than the comparison group, with differences that were statistically significant. There were other encouraging, although not statistically significant, differences.[10] In summary,

learning communities are an attractive strategy with encouraging empirical support. The learning community approach also is one strategy that is common in community colleges and that is consistent with the dominant theoretical perspective on student retention. That is, learning communities offer the potential for more in-class engagement with commuter students, who may not have a chance to participate in social and other extracurricular activities at the college. The use of learning communities should be expanded while outcomes continue to be tracked. In the future, researchers need to better account for the student recruitment and enrollment process in their analyses; also, they should examine the particular problems associated with scheduling and formatting learning communities so they can be most effective and convenient for nontraditional community college students.

Almost **one-fifth** of traditional-aged community college students **never** complete **10 credits.**

Developmental education and services for academically underprepared students

Improving the effectiveness of developmental (remedial) education is perhaps the most important issue confronting community colleges today. Most entering community college students arrive with academic skills that do not allow them to participate effectively in at least some college-level courses (Perin, forthcoming). Almost one-fifth of traditional-aged community college students never complete 10 credits,[11] and that number is probably higher for older students. Many of these students leave because of academic problems and, indeed, many students never successfully complete all developmental courses that are deemed necessary. Thus, as Summers (2003) pointed out: "[M]any institutions' primary strategy for reducing attrition is the early identification of students likely to drop out and the development and implementation of intervention services for those students" (p. 64). Therefore, colleges offer a variety of services for students with weak academic skills.

Based on their review of the literature on academic achievement, Pascarella and Terenzini (1991) suggested that institutions can aid the academic adjustment of poorly prepared students by providing extensive instruction in academic skills, advising, counseling and comprehensive support services. Although they reported findings primarily from studies of four-year colleges, Pascarella and Terenzini contended that their findings have been replicated in several national studies and that the results hold even after controlling for important student and institutional characteristics.

Some more recent results are mixed. Many find that students who enroll initially in developmental courses graduate at lower rates than do students who start in regular credit courses (Muraskin & Wilner, 2004), although, once again, many of these studies analyzed students at four-year colleges. In a study of college transcripts, Adelman (1998) found that the more remedial courses students were required to take, the less likely they were to earn a degree. Among students who attended two-year and/or four-year institutions and earned more than 10 credits, 45 percent of those who took two remedial courses earned either an associate's or bachelor's degree by the time they were 30 years old, compared with 60 percent of those who took no remedial courses. Students who are judged to have low reading skills in particular are more likely to need extensive remediation and less likely to earn a degree. Another study found that students at the Community College of Denver who started college in developmental classes were found to graduate at the same rate as students who started in regular courses (Roueche et al., 2001).

Researchers studying the effectiveness of developmental education face particularly serious methodological challenges. On average, students

who attend developmental education classes start out with weaker academic skills. As a result, it is hard to identify a causal relationship between remedial education and subsequent educational attainment. Even if students who start in developmental classes appear to do more poorly than other students, it is still possible that the remediation was effective; without it, the students might have done even worse. Comparing similar students who do and do not participate in developmental education is difficult because many states and individual institutions mandate remediation for students with low assessment scores.

A study by Bettinger and Long (2004) is of interest because it uses a statistical technique designed to identify the causal relationship in these types of cases, although, once again, it is a study restricted to four-year institutions. The Bettinger-Long study focused on a large sample of first-time, full-time students of traditional age enrolled in Ohio's non-selective public four-year colleges in the fall of 1998. The results suggest that students placed in remediation are more likely to withdraw from college, but they also indicate that participation in remedial courses does not seem to decrease the likelihood of transferring to more selective institutions or attaining a bachelor's degree.

Some studies compare outcomes for different types of developmental programs. The best known of these types of studies is the National Study of Developmental Education, conducted by the National Center for Developmental Education (Boylan, Bliss & Bonham, 1997). The programmatic implications of this and other studies of developmental education were subsequently published in *What Works: Research-Based Best Practices in Developmental Education* (Boylan, 2002).[12] This study tested the relative effectiveness of centralized programs (compared with decentralized programs), programs with tutorial services with trained tutors, programs with advising and counseling, and those programs that included evaluation on several outcome measures: first-term GPA, cumulative GPA, retention in development courses and success (earning a D or better) in math and English developmental courses. In general, this study found more positive results for four-year colleges than for two-year colleges, perhaps because four-year students may have had stronger initial skills.[13] The study did find some positive and statistically significant effects for community colleges on some of the outcomes listed above.

It is hard to identify a causal relationship between remedial education and subsequent educational attainment.

The National Study (Boylan et al., 1997) yielded useful information about developmental education, and its recommendations are in accord with the experience of many practitioners. However, the published reports exclude information that would be helpful for evaluating the effectiveness of remediation. For example, it would be interesting to know the magnitude of the effects. Also, because each program characteristic is analyzed separately, there is no way to determine if a particular program component is effective or whether it is effective only in combination with other components. Finally, it would also be important to know whether there are any other institutional features such as size, college organization, financial condition or typical student characteristics that might influence student outcomes and also be related to a particular program feature.

Boylan (2002) lists 33 features that he suggests are "best practices." The book references five institutions judged to have successful developmental programs for benchmarking purposes, but the evidence supporting the 33 practices comes primarily from other studies and reports, not from the five chosen sites.[14] Much of the research in this study on developmental/remedial education is either based on unpublished documents or material

in the National Center for Developmental Education's own publications. Thus, while many of these practices are widely used and considered effective by practitioners, it is difficult to judge whether the evidence supporting these practices is definitive.

Given the pervasiveness of developmental education and the controversy surrounding its practice, it is surprising that there is still so much uncertainty about the most effective approaches to working with students with weak academic skills. Grubb (2001), in his review of research on developmental education, argued that learning community formats for developmental education did appear to have positive benefits, but he found less evidence on the effectiveness of other approaches to remedial education. To be sure, the research is complicated by diverse state regulations and by local variation in the criteria used to place students in developmental programs, including differing "cutoff" scores on assessment tests. Further, many colleges use informal processes to alter these regulations on a case-by-case basis (Perin, forthcoming). But this overall complexity also offers researchers opportunities to make comparisons among similar students who do and do not enroll in formal remediation or who enroll in different types of developmental courses. As more detailed transcript-based data become available, considerable progress can be made on understanding the characteristics and effects of these strategies.

No program, however well designed, can work in isolation.

College-wide reform

So far we have reported on research about individual programs. Many practitioners believe their programs are successful for the students who take part in them. However, although there are certainly positive indications for all of these practices, we have suggested that an objective look at the empirical evidence and the methodologies used to test the effectiveness of these programs presents a more ambiguous picture. And, though many people believe in the effectiveness of individual programs, there is much more skepticism about whether they can be "taken to scale," that is, applied as institutional reforms. Completion rates at community colleges are low, and improving them significantly will probably require the successful expansion of pilot programs and the strengthening of related programs and services. No program, however well designed, can work in isolation. An excellent developmental or counseling program in a college with generally ineffective teaching may ultimately have no effect on student completion rates. We have found virtually no research that attempts to define and assess program institutionalization or broader college-wide reforms.

There have been initiatives designed especially to bring about reform throughout an institution. The best-known initiative for community colleges is the Learning College movement. Published work on this model (O'Bannion, 1997) presents useful accounts of the processes through which colleges have brought about important changes, but so far no rigorous assessment of this strategy has been published.

While community college practitioners believe that few colleges have been able to bring pilot programs to scale successfully, many are convinced that the Community College of Denver (CCD) has, over the past 20 years, succeeded in bringing about fundamental reforms in the basic ways that the college operates (Roueche et al., 2001). These reforms followed a systematic planning and benchmarking process and have included major changes in organization, teaching methods, counseling and student services, relationships to the community, and organizational philosophy. The study of CCD (Roueche et al., 2001) reported

increases in the number of graduates and in the number of graduates of color and concluded that "cohort tracking indicated no significant difference in student success on the basis of race, ethnicity, age, or gender" (p. 23). This study also reported that many CCD students of color transferred successfully, that there were high rates of student satisfaction with programs and instructors, and that surveyed employers demonstrated unanimous satisfaction with the skills of CCD graduates. These are encouraging results, although, as is true for much of the research we have described in this analysis, the information reported in the study is not adequate to judge whether the measured outcomes were caused by the described program changes or by other factors.[15] Given the importance of the CCD case, further investigation is warranted. Careful investigations of other institutional change efforts also are important. Nevertheless, the CCD experience suggests that institution-wide reform can have an effect, and that perhaps a focus on individual programs may be less effective.

Conclusions and implications for practice

This report has examined the research literature on effective institutional practices for improving retention and completion at community colleges in order to draw substantive lessons about those practices and to assess the overall state of research in the area. We will first review the substantive conclusions based on our review of the empirical research, including suggestions for additional research. We then present conclusions and suggestions about the research itself, discussing theoretical, data and methodological issues and outlining suggestions for strengthening the research that takes place at community colleges.

Substantive questions

We reviewed the research on the effectiveness of four types of practices in increasing persistence and completion at community colleges: 1) advising, counseling, mentoring and orientation programs; 2) learning communities; 3) developmental education and other services for academically underprepared students; and 4) broader, institution-wide reform.

Among the practices and strategies that we examined, existing research provides the most support for learning communities. The positive effects of learning communities on persistence and graduation are consistent with the most influential theoretical perspectives used to study retention, and empirical research also suggests positive effects. Thus learning communities offer an approach to connecting more intensively with community college students, who often spend little time on campus outside of classes. One important area for future research involves investigation of learning communities for part-time, nontraditional students.

Existing research provides the most support for learning communities.

Researchers and practitioners agree that counseling and advising are crucial for community college students. The national evaluation of the federally funded Student Support Services program has many useful conclusions, but that study is now

a decade old, and the policy and demographic environments have changed significantly in the intervening years. Many important research questions remain to be answered concerning the best design of student services, including the relationship between counseling and advising and the extent to which student services should be centralized or distributed among wider groups of faculty and staff.

Developmental education also has received considerable attention, and there is widespread agreement that it is one of the most important and challenging issues facing community colleges. Although researchers face difficult methodological problems, available data and current empirical techniques allow for significant improvement in the reliability of conclusions. Moreover, the major national study on developmental education is now 10 years old. Many issues concerning the organization and pedagogy of developmental education warrant further investigation. For example: Should these services be centralized or decentralized? Can developmental instruction be integrated into regular classes? Under what circumstances should developmental studies be considered prerequisites to other classes? How effective are alternatives to specialized developmental classes such as tutoring centers?

Other questions that need attention include: How can programs best be combined? What factors promote the institutionalization of successful pilot programs? Combining different reforms into comprehensive college-wide initiatives is an attractive prospect, but we are far from any concrete understanding about how such programs should be combined. Further, moving a successful pilot program to college-wide scale may be more difficult than implementing the pilot alone. Researchers can make important theoretical and empirical contributions in this area by developing models for organizational change at community colleges, by working out methods to measure that change, and by assessing the effectiveness of those strategies.

All of the substantive areas we analyzed illustrated weaknesses in community college research on program effectiveness. These weaknesses include an overemphasis on research on four-year colleges; lack of appropriate data on institutional practices; methodological problems, especially having to do with identifying causal relationships; and inadequate reporting, dissemination and discussion of research. We present suggestions in each of these areas below:

> Many issues concerning the organization and pedagogy of developmental education warrant further investigation.

Theoretical issues: We have emphasized in this report that the dominant theoretical perspective on retention, the student integration model, is most appropriate for traditional four-year students, particularly those living on campus. Empirical assessments of the model for community colleges have been inconclusive at best. Researchers have begun to focus on applying these concepts to "commuter" universities and colleges, but more work still needs to be done to take account of the particular characteristics of community colleges and their students. Future work should pay more attention to the needs of part-time, working students; to convenience and accessibility; to the particular problems of students with significant academic deficiencies; and to the focused occupational goals of many community college students.

Data availability: Because insufficient data exist on institutional practices, most program-effectiveness research is based on single-institution samples. While these can be useful, their conclusions are difficult to generalize because effects may be based on particular features of the college being

studied. As much as possible, national-level databases, such as those created by the National Center for Education Statistics, should include programmatic detail to allow research on the effectiveness of common practices used to improve student success. Collaborative projects within community college districts and states, supplemented with increasingly available state- or district-level student record data, also will be helpful in understanding student persistence and in overcoming the limitations of single-campus studies. Even with single-institution studies, research that makes use of transcript-based longitudinal data can provide many important insights. Current proposals to collect unit record data at the federal level may provide data that would be extremely useful in studying student success at community colleges. Concerns about student privacy may prevent the collection of these data, however.

The most difficult empirical problem in the assessment of retention practices is the attribution of causality.

Empirical issues: The most difficult empirical problem in the assessment of retention practices is the attribution of causality. Most of the programs that we have examined are voluntary, so comparisons of outcomes for participants and non-participants need to be interpreted carefully. Are differences in outcomes the result of program effects or of initial differences between the two groups?

There are several steps that researchers can take to purge the analysis of this distortion. Multivariate analysis can control for many characteristics. Perhaps the most important is some measure of pre-program academic ability: If a program enrolls more successful students, then it may not be surprising that program participants are more successful than comparison students. Pascarella and Terenzini (1991) generally discussed the strength of such controls in the studies that they reviewed, but many studies — especially unpublished, single-institution studies — fail to take this step, or at least fail to report it. However, even if available variables are included in an analysis, there may be unmeasured differences between the two groups. Students who sign up for a program may be more motivated than those who do not, even if their measured characteristics are similar. Indeed, this unobserved motivation may be the reason they sought assistance in the first place. Alternatively, counselors may encourage enrollment for students whom they judge might "benefit" from a program.

What can researchers do to address this problem of comparison group differences? Fundamentally, the solutions require an analysis or manipulation of the process through which students enter a program. One approach is for program organizers to enroll a group chosen at random from a pool of applicants, thereby eliminating any systematic differences between the two groups of applicants.[16] Unfortunately, this strategy is expensive. For practical reasons, such studies cannot usually form the basis of an expanded and invigorated research function on most campuses.

A second approach involves conducting a statistical analysis of the selection process and using those results to adjust the measurement of the program effect (see, for example, Bettinger & Long, 2004). This is an increasingly popular approach in program evaluation, but for the most part, it has simply not been used in the community college literature. The disadvantage is that this approach requires particular types of data that are often unavailable and a fairly high level of statistical skill. In addition, the results are sometimes difficult to interpret.

When these approaches are not possible, in addition to controlling for relevant measurable characteristics such as academic achievement,

researchers must include a detailed description of the process through which students entered a program so that the reader can make a judgment about the potential effect that the recruitment and enrollment process might have had on the analysis. If the selection process tends to enroll more motivated students, then the measured program effect may be exaggerated. Conversely, the enrollment process might result in an understatement of the program effect. For example, if counselors consciously send students with the most serious problems to a program, and if students in that program do as well as other students with similar measured characteristics, then it may be reasonable to conclude that the program was effective. Since many of the studies of programs involve one or a very small number of institutions, there is no reason why researchers cannot provide this type of information, yet few of the studies reviewed here did so.

The nation's community college **leaders** have come to agree that **colleges** must be more **"data-driven."**

Research at the community college: The majority of retention research published in mainstream education journals is written by university-based academics, and these researchers have so far largely overlooked the community college sector. Though beyond the scope of this report, it is an interesting point that researchers — who are usually preoccupied by the experience of minority, low-income and other underserved students — continue to neglect a sector of higher education that enrolls nearly half of all undergraduates and even larger percentages of underserved students.

Nevertheless, while it is important that university-based researchers pay more attention to community colleges, most research on effective practices at the colleges will likely be carried out at the colleges themselves. This is evident from the extensive review published by the National Learning Communities Project discussed earlier. Most of those studies were single-institution projects published by the individual institutions themselves. Moreover, during the last several years, the nation's community college leaders have come to agree that colleges must be more "data-driven" and shift from a "culture of anecdote" to a "culture of evidence." The research on which this report is based supports a major initiative begun in 2003 called Achieving the Dream: Community Colleges Count. That initiative is rooted in the principle that colleges should base their practice on systematic information and research. This implies a rise in the prominence of institutional research and an increase in the extent to which faculty and administrators use data and research to enhance the success of their students. The growing emphasis on analysis of student outcomes at both the state and the local levels is one encouraging development. Statewide data systems and more sophisticated cohort tracking on the campuses offer many promising opportunities for useful analysis.

Although, in principle, a shift toward "data-driven decision making" is not controversial, there is no consensus about exactly what such a shift entails or what constitutes "evidence." As we have seen, there is already some research on the issues of interest here, but in many cases, even in well-known and influential reports, methodologies are preliminary or are inadequately described. For example, samples and variable definitions are not well defined. Statements are made about what successful colleges do without defining how those exemplars were chosen. Reports provide too little detail about the programs and, especially, about how student participants are recruited and selected. Many studies look at several components of an overall program — for example, counseling and mandatory placement in remediation — one at

a time and then report the results for each one. But it may be possible that those components tend to go together, so it is not clear whether one or both elements have the effect, if there is an effect. Of course, it is possible that many of the details of the methodology are simply omitted from written reports in an attempt to make them more readable, but the reader has no way of knowing that.

Another barrier to data-driven decision making is simply the lack of time or opportunity to make it work. Because workloads are typically heavy at community colleges, and because the resources devoted to institutional research are often scant, faculty and administrators have few opportunities to develop a deep understanding of outcome data and forge a common plan to improve outcomes. Indeed, for many community college faculty members and administrators, the best opportunities to address these issues occur in brief panel discussions at conferences — such as those held by the American Association of Community Colleges or the League for Innovation in the Community College — or at one-time faculty workshops. Unfortunately, these events typically feature researchers asserting conclusions, not a thorough discussion of methods. Definitive and dubious results all are presented in a similar way, so participants can come away with a distorted view of the reliability of research findings.

Administrators have few opportunities to develop a deep understanding of outcome data.

Moreover, there is no widespread agreement about what constitutes useful analysis. In giving colleges advice about how to conduct evaluations on developmental education, one influential expert stated: "Evaluation of developmental education does not require the use of complicated statistics. Program outcomes can be accurately described using nothing more than percentages, bar graphs, and pie charts" (Boylan, 2002, p. 42). These types of descriptive statistics are useful to begin discussion and investigation, and they are important to provide a basis for wide engagement of faculty and administrators in discussions of policies and practices. Presenting research findings in a way that is understandable to a broad audience is key to their effectiveness. Nevertheless, evaluating the effectiveness of educational programs is difficult, and simple descriptive information can't paint a full picture. Such data should be seen as only a first step in understanding program effects.

In summary, developing a "culture of evidence" in community colleges involves a commitment to carry out thoughtful research — which often must be complex — and an ability to engage faculty, administrators and even students in meaningful discussions about the implications of that research. We present six suggestions for developing that culture:

1. Colleges must devote more resources and skills to research. Some community colleges have sophisticated research departments with well-trained personnel, but many institutional research departments are staffed by part-time researchers who have other primary responsibilities. A college's emphasis on institutional research demonstrates the depth of its leaders' commitment to management based on information and research. While colleges certainly need researchers with quantitative skills, qualitative research based on interviews, focus groups and observations also are important to understand and interpret quantitative findings.

2. Colleges must recognize that assessing the effectiveness of practices is difficult and involves a continuum of activities and analyses that range from simple descriptive

comparisons to more time-consuming and expensive controlled analyses and experiments. Randomized experiments are considered the "gold standard," but they are costly and difficult to implement. Short of the most ambitious methodologies, colleges can make a great deal of progress by employing thoughtfully designed approaches that use the increasingly available data at the campus and state levels.

3. Projects should combine quantitative research on student outcomes with qualitative research to elicit insights from students about those outcomes. Student perspectives are crucial for interpreting quantitative findings. Analysis of student longitudinal data may show that many students never complete developmental math classes, for example, but focus groups and interviews with those students can provide insights into why that happens and what steps might be successful in improving the class completion rates.

4. Colleges, states and college associations must provide more opportunities for faculty and administrators to discuss evidence about student outcomes. The typical short presentations with a few minutes of "Q&A" give a distorted view of research results. Moreover, thorough college-wide reform based on evidence requires broad-based participation. Research cannot be the province of a few specialists who report only to the top administration and board.

5. Colleges and states must develop more systematic methods to publicize and disseminate useful research findings from state and institutional research offices. State- and college-level researchers frequently analyze and assess policies and practices, but the results of this work are seldom published in ways that are useful to wider audiences. Many reports of "best practices" fail to provide enough backup information and data for readers to make an informed judgment about the practices' relative effectiveness. Assessment results are often only available in PowerPoint slides, institutional reports, various types of testimony, or in the files of institutional researchers.

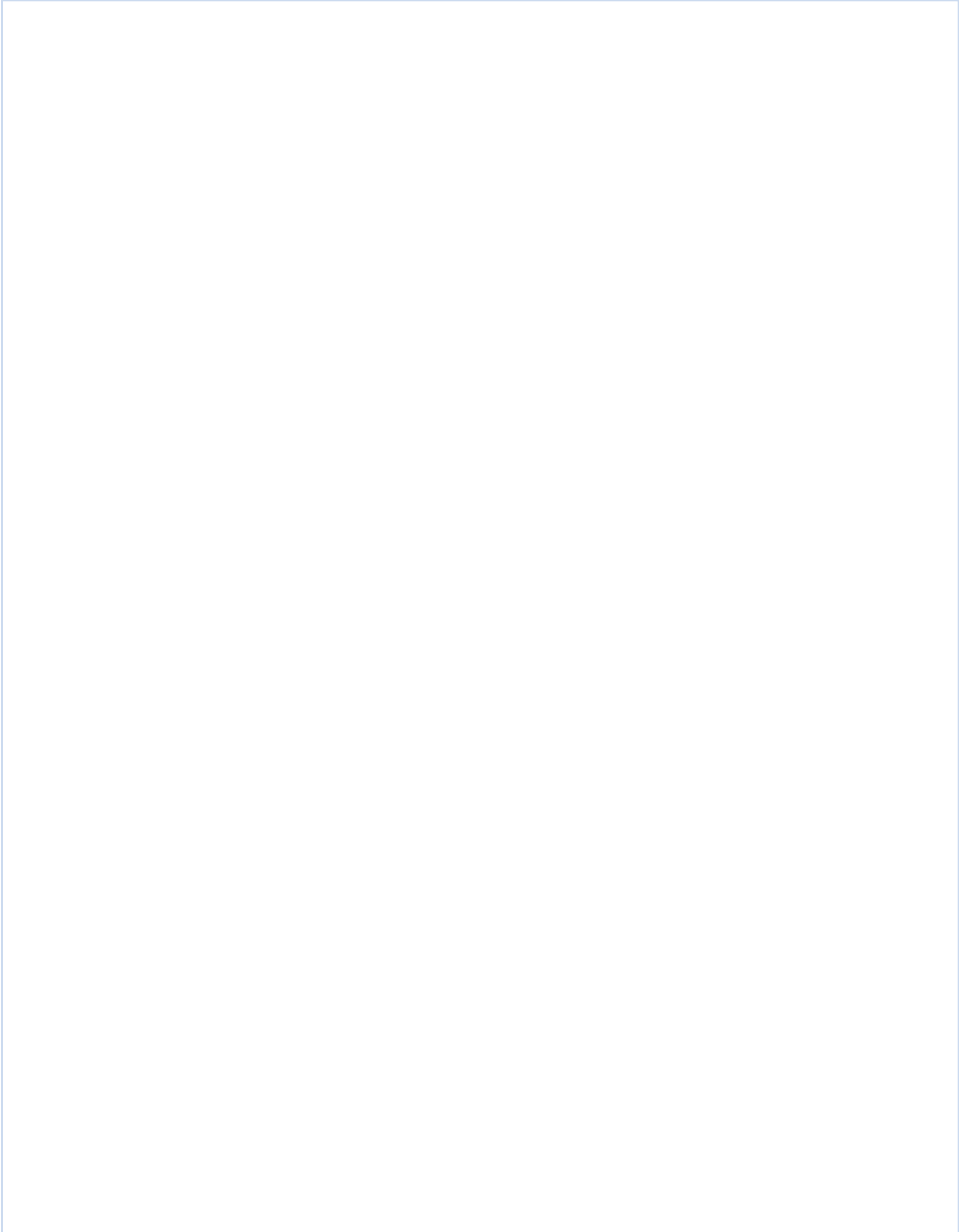
Educators, policy-makers and students must move forward based on the best information available.

6. Collaboration among academic, institutional and state-level researchers should be promoted. Researchers working to improve the performance of community colleges face formidable problems. They will have more chance of success if they use a variety of methodologies and if they combine research based on national, state and local data sets, as well as specific institutional and state-level knowledge.

We have criticized the quantity and quality of research on the effects of institutional practices on community college retention and completion rates, but we also are pragmatists. We recognize that community colleges are ongoing operations and that program improvement cannot await definitive research results. Educators, policy-makers and students must move forward based on the best information available, even if that information is subject to alternative interpretations. Still, as policy-makers, private funders and the public have increasingly turned their attention to community colleges, we have the opportunity to strengthen the available research and provide more useful

information as administrators and faculty members try to improve students' educational outcomes.

We suggest that, in planning activities, colleges search for the best information they can find. And they should search critically, recognizing that all research is not the same and that even the most definitive studies, such as those using random-assignment methodologies, have limitations. At the same time, they should do what they can to monitor progress and do so as thoroughly and rigorously as possible. The interaction between research and practice should not be seen as a search by experts for the final and definitive answer to the question "What works?" Rather, it is a constant and continuous process — a conversation within and among the colleges and with outside researchers and policy-makers, using the best possible data and the most appropriate methodologies, as practitioners try to improve their practice in a constantly changing environment.



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Endnotes

1. Completion rates in this paragraph are based on the authors' calculations from the Beginning Postsecondary Student Longitudinal Study of 1996-2001 (BPS96).

2. For more information on Achieving the Dream, see www.achievingthedream.org. The nine partner organizations are: American Association of Community Colleges; Community College Leadership Program, University of Texas-Austin; Community College Research Center, Teachers College, Columbia University; The Futures Project, Brown University; Jobs for the Future; Lumina Foundation for Education; MDC Inc.; MDRC; Public Agenda.

3. The mainstream journals reviewed were *The Journal of Higher Education*, *Research in Higher Education*, *The Review of Higher Education*, *Journal of College Student Development* and the *NASPA Journal*. Of these journals, the *Journal of Higher Education* had the highest community college share with 13 percent.

4. Authors' calculations from BPS96.

5. Fifty-three percent completed a bachelor's degree within nine years. This baccalaureate completion rate is much higher than typical contemporary cohorts.

6. Some of the for-profit institutions emphasize convenience over engagement. For example, the University of Phoenix has been known for using locations and schedules to facilitate the participation of working adults and has chosen not to promote student involvement by developing extracurricular campus activities.

7. We thank Kate Shaw for this point.

8. Although Tinto addressed the selection issue, he did not provide enough information to make a judgment about the extent to which it is a problem.

9. Thomas Brock, the principal investigator, reported that Kingsborough institutional research indicated that these types of students are often the least prepared and have low retention rates.

10. Personal communication with Thomas Brock, the principal investigator of the MDRC study. This study is scheduled to be published in early 2005 after results from a second cohort of Kingsborough students become available.

11. Authors' calculation from the National Education Longitudinal Study (NELS).

12. Since this study only examined students placed in developmental programs or courses, it could not measure the effect of developmental programs compared with placement into mainstream courses.

13. This type of information is not provided by this study.

14. The study itself presents no evidence of the effectiveness of the developmental programs at the five chosen sites. Indeed, the sites were chosen not on the basis of their outcomes (which are not reported), but on the basis of the programs that they used.

15. For example, the levels of satisfaction are reported for one point in time, but the reader does not know what those rates were before the introduction of the college-wide reforms. Enrollments and graduation rates improved, but we also know that recruitment policies at the college changed, resulting in a larger number of traditional-aged students; thus, the changing characteristics of the student body may have affected some of the results. Additionally, the study did not indicate how "student success" was defined and what control variables were used in the cohort analysis.

16. The MDRC study discussed earlier takes this approach.

About the authors

Thomas R. Bailey is the George and Abby O'Neill Professor of Economics and Education in the Department of International and Transcultural Studies at Teachers College, Columbia University. He holds a doctorate in labor economics from the Massachusetts Institute of Technology, and is an expert on the economics of education, educational policy, community colleges and the educational and training implications of changes in the workplace. In 1996, with support from the Alfred P. Sloan Foundation, Bailey established the Community College Research Center (CCRC) at Teachers College, which is now the leading independent research center devoted to the study of community colleges. It conducts a large portfolio of qualitative and quantitative research based on fieldwork at community colleges and analysis of national- and state-level data sets. Since 1992, Bailey also has been the director of the Institute on Education and the Economy at Teachers College, an interdisciplinary policy research center that focuses its attention on the interaction between education and the economy. His articles have appeared in a wide variety of policy-oriented and academic journals, and he has authored or co-authored several books on the employment and training of immigrants and the extent and effects of on-the-job training.

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ACHIEVING THE DREAM℠
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This monograph is based on research done to support a partnership effort called Achieving the Dream: Community Colleges Count. Achieving the Dream is a national initiative to increase the success of community college students, particularly those in groups that have been underserved in higher education.

It is a large-scale, multi-year initiative whose creation and implementation are being shared by several organizations committed to improving education and social policy. Achieving the Dream is funded by Lumina Foundation, managed by MDC Inc., and includes the following partner organizations:

- American Association of Community Colleges
- Community College Leadership Program, University of Texas-Austin
- Community College Research Center, Teachers College, Columbia University
- The Futures Project, Brown University
- Jobs for the Future
- MDRC
- Public Agenda

In the coming years, the initiative expects to attract other organizations, including additional funders.

In its initial phase, 27 community colleges in five states are participating in Achieving the Dream. These colleges all have made a commitment to improve the success of underserved students on their campuses, to use data to guide their decisions, and to broadly share the lessons they learn so that students in other institutions and states can benefit.

For more information on the initiative, visit www.achievingthedream.org.

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